This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

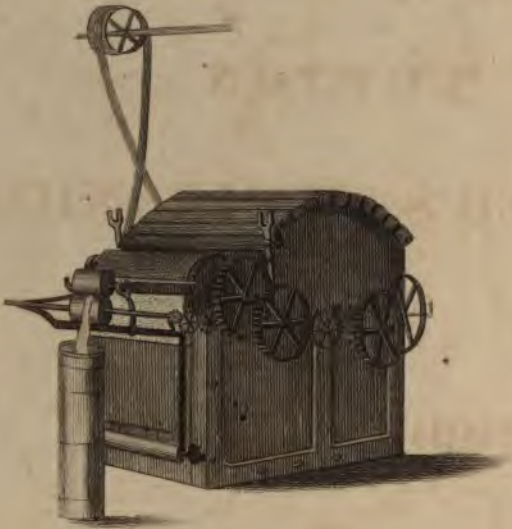
27-795.

27-795.

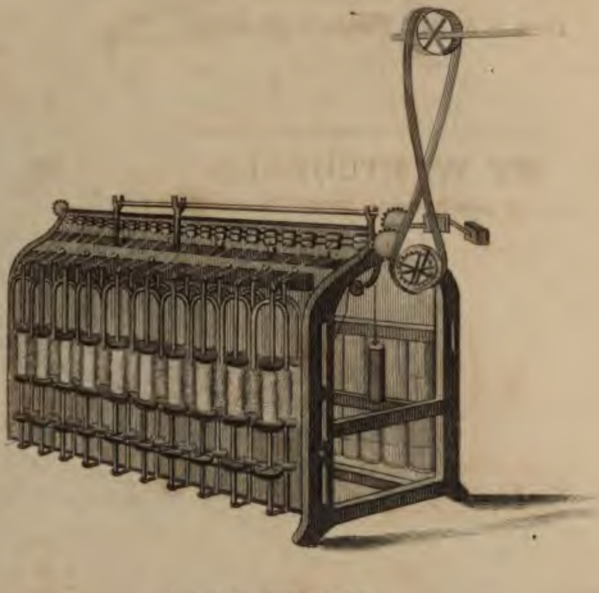
27-795.

27-795.

27-795.



CARDING ENGINE.



JACK FRAME.

Simpson Eng^d Church Gates Manch^r

✓ 116 J.B. 1827.

THE

COTTON SPINNER'S COMPANION,

CONTAINING

Original Tables,

FOR

PREPARING AND SPINNING COTTONS OF EVERY DESCRIPTION

From 6 *to* 320 *Hanks in the Pound.*

BY W. ETCHELLS,
AUTHOR OF THE COTTON SPINNER'S ASSISTANT.

MANCHESTER:
Printed and Sold by JOHN GRESWELL, Barlow's-court, Market-street;
Sold also by
Messrs. W. & W. CLARKES, Market-place, and by the Author,
87, Pump-street, Oldham-road.

1827. 795.
Price Two Guineas.

Entered at Stationers Hall.

BIBLIOTHECA·BODLEIANA

ADDRESS.

THE almost insurmountable difficulty attendant on a work of this nature must be very apparent on a close inspection of the tables, consequently the length of time required not only to MAKE, *but* PROVE *the present calculations has, of course, been very great; indeed they have almost taken the whole of the time the Author has been employed in the practical part of spinning cotton.*

He has endeavoured to render it as concise, plain, and simple as the nature of it would admit; and great pains have been taken to make the work as correct as possible, except the very lowest denominations of fractions, which would only serve to complex and swell the work, and would be of no use whatever to the Cotton Spinner.

The Author is fully aware of the importance of the subject he has undertaken to illustrate, and his knowledge is entirely gained by the practice he has had both as an operative spinner and a manager. The calculations were made merely for his own use, and at one time were never intended for the press; but the circumstance of their never having been a similar work published has induced him to throw it on the hands of the Cotton Spinners, respectfully soliciting their patronage and support.

No. 87, *Pump-street, Oldham-road, Manchester.*

April 9*th.* 1827.

INTRODUCTION.

PREVIOUS to the explanation of this work, the Author begs leave to make a few remarks on the *choice and quality of Cottons*, so far as they have come under his observation; but to enumerate all the different sorts would be needless, for there scarcely a year passes but some sorts are running out, and others have to be substituted in their places. The cottons that are generally used for course weft are *Bengals, Surats, Boweds, &c.;* for fine wefts, *Orleans, Bourbon, Sea Islands, &c.;* for course twist, *Pernams, Maranhams, Egyptians, &c.* and for fine twist, *Georgia, St. Simons, Sea Islands, &c.*

Cottons of a short staple, soft and weak, are only suitable for wefts, for it is impossible to make strong yarn out of short or weak cotton, consequently if strong yarn is wanted to be made great care must be taken that the fibre or staple of the cotton be not broken in the different processes it has to pass through, particularly in the blowing or scutching machines, by setting the beater at a proper distance from the feed roller. Much depends upon the cleaning of cotton, for if it is not well opened, and the motes and dead cotton taken out, it is impossible to make clean carding, and if it is not carded clean a clear level thread cannot be made. In spinning it often happens that long, strong, and fine cottons are spoiled in the first operation, to avoid which the cotton should be batted and opened a little, then the large motes and dead cotton picked out, and batted a little more and again picked; proceed in this manner until the cotton is quite clean, for if the large motes and dead cotton should be broken in the good cotton it will require more trouble, make more waste, and not be as clean when done.

These Tables are in two parts, the first of which is for carding, drawing, roving, and stretching, and shews the weight of cotton to be put on the cards, with the length of the feed for both breakers and finishers, to produce rovings of from 2 to 30 hanks in the pound; the diameters and revolutions of the feed roller, main cylinder, doffing cylinder, and lap drum, with the revolutions of the main cylinder per minute; the heads of drawing, with roving and stretching; the ends put up, drafts and distances that will produce a level roving. There are nine different widths of wire, nine different diameters of feed rollers, three of main cylinders, and six of doffing cylinders, the whole of which are calculated to produce rovings of the same number of hanks in the pound. The first table consists of nine parts; each part consists of four pages, six divisions, and five sections, and reads across two pages. In the nine parts there are nine different widths of wire, commencing with 18, and advancing progressively with 6 inches (the common difference) up to 36 inches inclusive; then from 4 up to 40; from 40 it advances progressively with 2 up to and including 48 inches. There are three divisions on every two pages; the first division consists of four columns, and contains the hank roving; the second is the weight of cotton, marked *oz. dwts. grs.*; the third and fourth are the length of feed, and are marked *ft. in.* namely the feet and inches the cotton is to be spread on the feed to produce the hank roving wanted, according to the width of the wire on the top of the page. The second division consists of eight columns; the first four contain the diameters of the feed roller, main cylinder, doffing cylinder, and lap drum, marked *ft. in.*; the second four contain the revolutions of feed roller, main cylinder, doffing cylinder, and lap drum, which are described in the heading. The third division consists of seven columns, namely, the heads of drawing, with roving and stretching, the ends put up, drafts and distances, and are also described at the top of each column. Each four pages consist of five sections, three upon the two first pages and two upon the second, in these sections will be found the weight of cotton, &c. for any hank roving wanted that is contained in this Table, according to the width of the wire at the top of the page—for example, required the proper weight of cotton to be put on the cards for a five hank roving, under any width of wire that is contained in this table?—In the first division third section and first column will be found 5 hanks in the pound, on the same line will be found 9*oz.* 3*dwt.* 23*gr.* the weight required. Any hank roving or any weight may be found in the same way, under the different widths of wire. If it is intended to card by only one operation double the revolutions of the main cylinder for feed roller one; and if there are more ends put up in the heads of drawing than are mentioned in the table, the drafts must be added in the same proportion throughout the different processes.

Second or spinning table, consists of two parts, the first of which shews the numbers of yarn that can be produced from 6 to 351 hanks in the pound from rovings of from 1 to 31 hanks in the pound; first with a draft of 6, 7, 8, and 9 in the rollers, which is for single roving spinning—the second with a draft of 9, 10, 11, and 12 in the rollers, and is for double roving spinning; with the inches delivered by the rollers, and the proper quantity of gaining and stretching to each part and number. They each contain eight columns, the first is the hank roving, the second, third, and fourth are the inches delivered by the rollers, the inches gained and stretched, and the length of the stretch; the remaining columns shew the hanks in a pound of yarn, according to the various drafts on the top of each column,—for example, required what numbers can be produced from a 10 hank roving, with a draft of 6, 7, 8, and 9 in the rollers? See the second part of this work, page 42, in the first column will be found a 10 hank roving, and on the same line you will find 49 inches, delivered by the rollers, 7 inches gained and stretched, and 56 the length of the stretch, which will produce 68, 80, 91, and 102 hanks in the pound, and is for single roving spinning. For double roving a 20 hank single roving must be taken, as it will only count 10 when doubled;—if it is wanted to be known what numbers can be produced from a 20 hank roving, when double, with a draft of 9, 10, 11, and 12 in the rollers, see the second part of this work, page 43; in the first column will be found a 20 hank roving, on the same line will be found 46 inches delivered by the rollers, 10 inches gained and stretched, and the length of the stretch 56 inches, which will produce 109, 121, 133, and 146 hanks in the pound, according to the various drafts on the top of each column.

There are 240 various numbers in this table, which it is supposed, will be sufficient for general use, as one inch more may be added in gaining and stretching than is mentioned in the tables, without injuring the yarn, for if one inch more be gained or stretched it will gain 1.22 hanks at 60; 2.60 at 120; 4.28 at 180; and 5.85 at 240, &c. so hat by this method if exact numbers by rovings and pinions cannot be got; yet by adding or diminishing one inch or one half inch you may spin the exact numbers wanted.

EXAMPLE.—To spin 145 hanks in the pound from double rovings, with a draft of 12 in the rollers.

Method.—Put two 20 hank rovings together, call them 10, then multiply 10 (the hank roving) by 12 (the draft in the rollers) the product of which will be 120 hanks, multiply 120 by 56 (the length of the stretch) which will give 6720; divide this product by 46 (the inches delivered by the rollers) the quotient will then be 146 hanks, one more than is required—See the second part, page 43, on the same line with a 20 hank roving in the last column will be found 146 hanks, —if you divide 6720 by 46.25 the quotient will then be 145 hanks, the number required.

Second or spinning table, part 2—table 2 shews, the method of making yarn of seven different qualities, to answer the various sorts of cloth that are made, viz. two of soft weft, two of hard weft, one of reeled twist, and two of cop twist or warp, from 10 to 320 hanks in the pound, with the proper quantity of twists necessary for each number. This table consists of 23 parts, each part contains eleven columns; the first contains the hank roving, the second, third, and fourth, the inches delivered by the rollers and the inches gained and stretched.—5th. the length of the stretch; the remaining columns contain the revolutions of the rim or handle throughout the different stages of the process, the revolutions of the spindle for the rim or handle one, and the revolutions of the spindle in the production and completion of each inch of yarn.

This table is also calculated to make yarn by 23 different methods; the first, second, and third, parts are for soft weft, from 10 to 100 hanks in the pound, commencing with 17 twists in one inch for 10 hanks, advancing progressively (that is with one twist the common difference) up to 30 twists for 100 hanks inclusive; the fourth, fifth, and sixth parts contain the mode of making soft weft, commencing with 18 twists in one inch, and are an approximation of the 1st. 2nd and 3rd.differing from them only in twist. The seventh, eight, and ninth, parts shew the method of making hard weft from 10 to 320 hanks in the pound, with the proper quantity of twist necessary to each number, commencing with 19 twists in one inch for 10 hanks, and advancing progressively up to 58 twists in one inch for 320 hanks inclusive. The tenth, eleventh, and twelfth parts contain the mode of making hard weft, commencing with 21 twists in one inch, and are an approximation of the seventh, and eighth parts, differing from them only in twist. The thirteenth, fourteenth, and fifteenth parts, shew the method of making reeled twist from 10 to 320 hanks in the pound, with the proper quantity of twist necessary to each number, commencing with 22 twists in one inch for 10 hanks, and advancing progressively up to 59 and 60 twists in one inch for 320 hanks inclusive. The sixteenth, seventeenth, and eighteenth parts contain the mode of making single roving twist, commencing with 23 twists in one inch, and are an approximation of the thirteenth, fourteenth, and fifteenth parts, differing from them only in the revolutions of the rim or handle, and the revolutions of the spindle in each inch of yarn. The 19th, 20th, and 21st, parts shew the method of making double roving cop twist or warp from 10 to 260 hanks in the pound, with the proper quantity of twist necessary to each number, commencing with 23 twists in one inch for 10 hanks, and advancing progressively up to 54 twists in one inch for 260 hanks inclusive. The twenty-second and twenty-third parts contain the mode of making cop twist or warp, and are an approximation of the nineteenth, twentieth, and twenty-first parts, differing only in the length of the stretch, the revolutions of the rim or handle, and the revolutions of the spindle in the production and completion of each inch of yarn.

EXAMPLE—To spin 40's twist from a five hank roving, for which there is a new set of preparation—to produce that hank roving, what weight must be put on the cards for 18 inch wire, allowing 1½*oz.* in the pound for waste.

Method.—If the feed roller is 1⅛*in.* diameter, the length of the feed is 9*ft.* 5*in.* and the doffing cylinder 1 *ft.* in diameter. First find the girth or circumference of the feed roller, which will produce 3.53*in.* Multiply 9*ft.* 5*in.* (the length of the feed) by 12*in.* which will give 113*in.* then multiply 113 by 32 (the parts in 1 inch) and the product will be 3616; divide this by 113 (the girth of the feed roller) and the quotient will be 32 (the revolutions of the feed roller in taking the feed) then find the circumference or girth of the doffing cylinder, which is 37.76; this multiplied by 4.66 (the revolutions of the doffing cylinder for feed roller one) gives 175.9616*in.* (call it 176*in.*) which multiplied by 32 (the revolutions of the feed roller in taking in the feed) gives 5632, the inches delivered by the carding engine, from which it is taken to the drawing frame, and is drawn through 4 heads of drawing, putting up 4 ends to each head; then passes through roving and stretching, and produces 79586.71, which divided by 54 (the length of the stretch) gives 1473.82 threads, this divided by 80 the number of threads in a lea) gives 18.42 leas, which are equal to 2 hanks and 4.60 leas.

EXAMPLE.—To spin 40's twist from a 5 hank roving, with a draft of 7½ in the rollers, when 52.3*in.* are delivered by the rollers, 4*in.* gained and stretched, and 56*in* the length of the stretch.

Method.—First find the draft in the rollers, by multiplying the drivers together, the product must again be multiplied by the circumference of the back roller, the product of which will be the divisor. Then multiply the driven together, the product of which must again be multiplied by the circumference of the front roller, the product of which will be the dividend. The quotient will be the draft in the rollers, which multiplied by the hank roving gives the hanks in a pound of yarn delivered by the rollers. The number of hanks in a pound delivered by the rollers must be multiplied by the length of the stretch, and the product must be divided by the inches delivered by the rollers, (to find the number of which you must multiply the revolutions of the front roller by its own circumference) The quotient will be the number wanted.

NOTE. To reduce ounces into grains, multiply by 437.5, the grains in 1oz. for pennyweights multiply by 24, the grains in 1dwt. This is required in consequence of the ounces being Avoirdupois, and the smaller weights Troy.

☞ In the second or stretching frame table, if the rovings are to spin twist the spindle is to run weft way, and if weft it is to run twist way.

FIRST

OR

PREPARATION TABLE,

Shewing the weight of cotton to be put on the cards, with the length of the feed for both breakers and finishers; the diameters and revolutions of the feed roller, main cylinder, doffing cylinder, and lap-drum; the number of heads of drawing, with roving and stretching; the ends put up, drafts, and distances.

There are three divisions, the first of which contains the hank roving, weight and length of cotton; the second division contains the diameters and revolutions; and the third division contains the ends put up, drafts, and distances.

This table is calculated for nine different widths of wire, commencing with 18 inch, and advancing progressively, that is with 6 inches, (the common difference) up to 36 inclusive, then with 4 up to 40; and from 40, advancing progressively, that is with 2 inches (the common difference) up to 48 inches inclusive.

◆

TABLE I.—PART I.

For 18 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	11	0	6	9	0	9	5
2¼	9	14	9	8	3	,,	
2½	8	14	19	7	6	,,	
2¾	8	0	4	6	9	,,	
3	7	6	6	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	9	14	16	9	0	9	5
3½	8	7	8	8	3	,,	
4	7	6	0	7	6	,,	
4½	6	9	2	6	9	,,	
5	5	16	2	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
5	9	3	23	9	0	9	5
5½	8	6	22	8	3	,,	
6	7	12	10	7	6	,,	
6½	7	1	15	6	9	,,	
7	6	10	15	6	5	,,	
7½	6	2	9	6	0	,,	
8	5	13	21				
8½	5	7	16				
9	5	2	5				
9½	4	15	12				
10	4	11	2				
10½	4	7	2				
11	4	3	11				
11½	4	0	3				
12	3	15	8				
12½	3	12	12				
13	3	9	22				
13½	3	7	13				
14	3	5	7				
14½	3	3	6				
15	3	1	7				
15½	2	17	18				
16	2	16	1				

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	0	3	0	54
1⅜	,,		,,		,,		60
1½	,,		,,		,,		65
1⅝	,,		,,		,,		70
1¾	,,		,,		,,		76
1⅞	,,		,,		,,		81
2	,,		,,		,,		87

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	0	3	0	69
1⅜	,,		,,		,,		76
1½	,,		,,		,,		83
1⅝	,,		,,		,,		90
1¾	,,		,,		,,		97
1⅞	,,		,,		,,		104
2	,,		,,		,,		111

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	0	3	0	71
1⅛	,,		,,		,,		80
1¼	,,		,,		,,		89
1⅜	,,		,,		,,		98
1½	,,		,,		,,		107
1⅝	,,		,,		,,		116
1¾	,,		,,		,,		124
1⅞	,,		,,		,,		133
2	,,		,,		,,		142

TABLE I.—PART I.

For 18 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
12.79	4.22	130
,,	4.65	,,
,,	5.06	,,
,,	5.5	,,
,,	5.94	,,
,,	6.32	,,
,,	6.74	,,
13.69	5.04	120
,,	5.44	,,
,,	6.05	,,
,,	6.55	,,
,,	7.04	,,
,,	7.55	,,
,,	8.06	,,
17.15	4.14	110
,,	4.66	,,
,,	5.18	,,
,,	5.71	,,
,,	6.24	,,
,,	6.71	,,
,,	7.23	,,
,,	7.75	,,
,,	8.29	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller. in.	Distance between Back and Middle Roller. in.
1st Head . .	3	3	$1\frac{1}{4}$	1	$0\frac{15}{16}$	$0\frac{7}{8}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
3rd ,, . .	4	4	$1\frac{1}{2}$	1	1	1
1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
2nd ,, .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$
Stretching .	2	4	7	6	$1\frac{1}{8}$	$1\frac{1}{4}$

This is for Cotton that is $0\frac{7}{8}$*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller. in.	Distance between Back and Middle Roller. in.
1st Head . .	3	3	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	1
1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
Stretching .	2	$4\frac{1}{2}$	7	6	$1\frac{3}{16}$	$1\frac{1}{4}$

This is for Cotton that is 1*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller. in.	Distance between Back and Middle Roller. in.
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{16}$	1
2nd ,, . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
1st Roving .	2	5	$1\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
2nd ,, . .	2	5	2	1	$1\frac{1}{8}$	$1\frac{3}{16}$
Stretching .	2	$5\frac{1}{4}$	8	7	$1\frac{1}{4}$	$1\frac{3}{8}$

This is for Cotton that is $1\frac{1}{8}$*in.* in Staple.

The various distances of the rollers, to suit the length of all Cottons, are calculated from centre to centre, throughout the work.

TABLE I.—PART I.

For 18 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
17	2	16	18	6	0	9	5
18	2	13	19	6	0	,,	
19	2	11	3	5	9	,,	
20	2	8	18	5	9	,,	
21	2	6	14	5	6	,,	
22	2	4	15	5	6	,,	

This is allowing 1½*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
23	2	10	0	5	9	9	5
24	2	8	2	5	9	,,	
25	2	6	7	5	9	,,	
26	2	4	16	5	6	,,	
27	2	3	3	5	6	,,	
28	2	1	17	5	6	,,	
29	2	0	9	5	3	,,	
30	1	17	9	5	3	,,	

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	0	3	0	75
1⅛	,,		,,		,,		84
1¼	,,		,,		,,		93
1⅜	,,		,,		,,		103
1½	,,		,,		,,		112
1⅝	,,		,,		,,		121
1¾	,,		,,		,,		131
1⅞	,,		,,		,,		140
2	,,		,,		,,		149

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	0	3	0	82
1⅛	,,		,,		,,		91
1¼	,,		,,		,,		101
1⅜	,,		,,		,,		111
1½	,,		,,		,,		121
1⅝	,,		,,		,,		131
1¾	,,		,,		,,		141
1⅞	,,		,,		,,		151
2	,,		,,		,,		161

TABLE I.—PART I.

For 18 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder fo Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in.	*in.*
18.11	4.14	100	1st Head . .	4	3½	1½	1	1⅛	1 1/16
,,	4.66	,,	2nd ,, . .	4	4	1½	1	1⅛	1⅛
,,	5.18	,,	3rd ,, . .	4	4	1¾	1	1 3/16	1 3/16
,,	5.71	,,	4th ,, . .	4	4½	1¾	1	1 3/16	1 3/16
,,	6.24	,,	1st Roving .	2	4½	1¾	1	1 3/16	1 3/16
,,	6.71	90	2nd ,, .	2	5	2	1	1 3/16	1¼
,,	7.23	,,	Stretching .	2	5½	7	6	1¼	1½
,,	7.75	,,	This is for Cotton that is 1 3/16 *in.* in Staple.						
,,	8.29	,,							
								in.	*in.*
18.26	4.49	80	1st Head . .	4	3½	1½	1	1⅛	1 1/16
,,	5.05	,,	2nd ,, . .	4	4	1½	1	1 3/16	1⅛
,,	5.61	,,	3rd ,, . .	4	4	1¾	1	1 3/16	1 3/16
,,	6.17	,,	4th ,, . .	4	4½	1¾	1	1 3/16	1 3/16
,,	6.73	,,	1st Roving .	2	4½	1¾	1	1¼	1¼
,,	7.29	70	2nd ,, . .	2	5	2	1	1¼	1¼
,,	7.85	,,	Stretching .	2	6	8	7	1⅜	1½
,,	8.39	,,							
,,	8.95	,,	This is for Cotton that is 1¼*in.* in Staple.						

TABLE I.—PART II.

For 24 *inch wire.*

No. 1 Division. No. 2 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.	Length of Feed for Breakers.	Length of Feed for Finishers	Diameter of Feed Roller.	Diameter of Main Cylinder.	Diameter of Doffing Cylinder.	Diameter of Lap Drum.	Revolution of Main Cylinder for Feed Roller one.
	oz. dwt. gr.	*ft. in.*	*ft. in.*	*in.*	*ft. in.*	*ft. in.*	*ft. in.*	
2	14 12 12	9 0	9 5	1¼	3 1	1 2	3 0	54
2¼	13 0 23	8 3	”	1⅜	”	”	”	60
2½	11 13 15	7 6	”	1½	”	”	”	65
2¾	10 12 9	6 9	”	1⅝	”	”	”	70
3	9 14 9	6 5	”	1¾	”	”	”	76
This is allowing 1¾*oz.* in the *pound* for waste.				1⅞	”	”	”	81
				2	”	”	”	87
	oz. dwt. gr.	*ft. in.*	*ft. in.*	*in.*	*ft. in.*	*ft. in.*	*ft. in.*	
3	13 1 7	9 0	9 5	1¼	3 1	1 2	3 0	69
3½	11 3 17	8 3	”	1⅜	”	”	”	76
4	9 14 16	7 6	”	1½	”	”	”	83
4½	8 13 0	6 9	”	1⅝	”	”	”	90
5	7 15 9	6 5	”	1¾	”	”	”	97
This is allowing 1¾*oz.* in the *pound* for waste.				1⅞	”	”	”	104
				2	”	”	”	111
	oz. dwt. gr.	*ft. in.*	*ft. in.*	*in.*	*ft. in.*	*ft. in.*	*ft. in.*	
5	12 5 7	9 0	9 5	1	3 1	1 2	3 0	71
5½	11 3 4	8 3	”	1⅛	”	”	”	80
6	10 4 10	7 6	”	1¼	”	”	”	89
6½	9 8 7	6 9	”	1⅜	”	”	”	98
7	8 14 5	6 5	”	1½	”	”	”	107
7½	8 3 13	6 0	”	1⅝	”	”	”	116
8	7 12 10			1¾	”	”	”	124
8½	7 4 4			1⅞	”	”	”	133
9	6 15 2			2	”	”	”	142
9½	6 8 13							
10	6 2 15							
10½	5 15 13							
11	5 10 16							
11½	5 6 6							
12	5 2 5							
12½	4 16 17							
13	4 13 6							
13½	4 10 1							
14	4 7 2							
14½	4 4 8							
15	4 1 18							
15½	3 17 14							
16	3 15 8							
This is allowing 1½*oz.* in the *pound* for waste.								

TABLE I.—PART II.

For 24 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in.	*in.*
15	3.64	130	1st Head . .	3	3	1¼	1	$0\frac{15}{16}$	0⅞
,,	3.99	,,	2nd ,, . .	3	3½	1¼	1	1	$0\frac{15}{16}$
,,	4.35	,,	3rd ,, . .	4	4	1½	1	1	1
,,	4.71	,,	1st Roving	2	3½	1¼	1	1	1
,,	5.08	,,	2nd ,, . .	2	4	1½	1	$1\frac{1}{16}$	1⅜
,,	5.43	,,	Stretching .	2	4	7	6	1⅛	1¼
,,	5.82	,,							

This is for Cotton that is 0⅞*in.* in Staple.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in	*in.*
15	4.32	120	1st Head . .	3	3	1¼	1	1	$0\frac{15}{16}$
,,	4.66	,,	2nd ,, . .	3	3½	1¼	1	1	1
,,	5.19	,,	3rd ,, . .	4	4	1½	1	$1\frac{1}{16}$	1
,,	5.62	,,	1st Roving .	2	3½	1¼	1	1⅛	$1\frac{1}{16}$
,,	6.04	,,	2nd ,, .	2	4	1½	1	1⅛	1⅛
,,	6.47	,,	Stretching .	2	4½	7	6	$1\frac{3}{16}$	1¼
,,	6.91	,,							

This is for Cotton that is 1*in.* in Staple.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in.	*in.*
20	3.55	110	1st Head . .	4	3½	1¼	1	$1\frac{1}{16}$	1
,,	4.	,,	2nd ,, . .	4	3½	1¼	1	1⅛	$1\frac{1}{16}$
,,	4.45	,,	3rd ,, . .	4	4	1½	1	1⅛	1⅛
,,	4.90	,,	4th ,, . .	4	4½	1½	1	1⅛	1⅛
,,	5.35	,,	1st Roving .	2	5	1½	1	1⅛	1⅛
,,	5.75	,,	2nd ,, . .	2	5	2	1	1⅛	$1\frac{3}{16}$
,,	6.20	,,	Stretching .	2	5¼	8	7	1¼	1⅜
,,	6.65	,,							
,,	7.11	,,							

This is for Cotton that is 1⅛*in.* in Staple.

For 24 *inch* Cards draw, ⅛ part more in the 2nd head of drawing, and ⅛ part more in the first roving, or a head of drawing at the Carding Engine; the front roller making 1¼ revolution for Back 1.

TABLE I.—PART II.

For 24 inch wire.

No. 1 Division.								No. 2 Division.							
Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.		Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
17	3	16	6	6	0	9	5	1	3	1	1	2	3	0	75
18	3	11	21	6	0	,,		1⅛	,,		,,		,,		84
19	3	8	19	5	9	,,		1¼	,,		,,		,,		93
20	3	5	14	5	9	,,		1⅜	,,		,,		,,		103
21	3	2	7	5	6	,,		1½	,,		,,		,,		112
22	3	0	3	5	6	,,		1⅝	,,		,,		,,		121
								1¾	,,		,,		,,		131
								1⅞	,,		,,		,,		140
								2	,,		,,		,,		149

This is allowing 1⅓*oz.* in the *pound* for waste.

	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
23	3	7	7	5	9	9	5	1	3	1	1	2	3	0	82
24	3	4	17	5	9	,,		1⅛	,,		,,		,,		91
25	3	2	8	5	9	,,		1¼	,,		,,		,,		101
26	3	0	3	5	6	,,		1⅜	,,		,,		,,		111
27	2	16	8	5	6	,,		1½	,,		,,		,,		121
28	2	14	10	5	6	,,		1⅝	,,		,,		,,		131
29	2	12	16	5	3	,,		1¾	,,		,,		,,		141
30	2	11	1	5	3	,,		1⅞	,,		,,		,,		151
								2	,,		,,		,,		161

This is allowing 1⅓*oz.* in the *pound* for waste.

TABLE I.—PART II.

For 24 inch wire.

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
21.12	3.55	100
,,	4.	,,
,,	4.45	,,
,,	4.90	,,
,,	5.30	,,
,,	5.80	90
,,	6.20	,,
,,	6.65	,,
,,	7.10	,,
21.3	3.85	80
,,	4.33	,,
,,	4.85	,,
,,	5.30	,,
,,	5.80	,,
,,	6.28	70
,,	6.72	,,
,,	7.25	,,
,,	7,73	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
2nd ,, . .	2	5	2	1	$1\frac{3}{16}$	$1\frac{1}{4}$
Stretching .	2	$5\frac{1}{2}$	7	6	$1\frac{1}{4}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{3}{16}$*in.* in Staple.

					in.	in.
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{3}{16}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving .	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$
2nd ,, .	2	5	2	1	$1\frac{1}{4}$	$1\frac{1}{4}$
Stretching .	2	6	8	7	$1\frac{3}{8}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{1}{4}$*in.* in Staple.

TABLE I.—PART III.

For 30 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	18	6	12	9	0	9	5
2¼	16	5	19	8	3	,,	
2½	14	12	12	7	6	,,	
2¾	13	6	9	6	9	,,	
3	12	4	8	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	16	5	19	9	0	9	5
3½	14	0	2	8	3	,,	
4	12	4	15	7	6	,,	
4½	10	16	7	6	9	,,	
5	19	14	16	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

	oz.	*dwt.*	*gr.*	*ft.*	*in*	*ft.*	*in.*
5	15	6	14	9	0	9	5
5½	13	17	14	8	3	,,	
6	12	14	15	7	6	,,	
6½	11	14	21	6	9	,,	
7	10	17	10	6	5	,,	
7½	10	4	9	6	0	,,	
8	9	10	23				
8½	9	0	10				
9	8	9	18				
9½	8	1	13				
10	7	12	10				
10½	7	5	18				
11	6	17	22				
11½	6	12	9				
12	6	7	7				
12½	6	2	15				
13	5	16	13				
13½	5	12	3				
14	5	8	21				
14½	5	5	10				
15	5	2	4				
15½	4	17	10				
16	4	14	14				

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	4	3	0	54
1⅜	,,		,,		,,		60
1½	,,		,,		,,		65
1⅝	,,		,,		,,		70
1¾	,,		,,		,,		76
1⅞	,,		,,		,,		81
2	,,		,,		,,		87

in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	4	3	0	69
1⅜	,,		,,		,,		76
1½	,,		,,		,,		83
1⅝	,,		,,		,,		90
1¾	,,		,,		,,		97
1⅞	,,		,,		,,		104
2	,,		,,		,,		111

in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	4	3	0	71
1⅛	,,		,,		,,		80
1¼	,,		,,		,,		89
1⅜	,,		,,		,,		98
1½	,,		,,		,,		107
1⅝	,,		,,		,,		116
1¾	,,		,,		,,		124
1⅞	,,		,,		,,		133
2	,,		,,		,,		142

TABLE I.—PART III.

For 30 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
17	3.2	130
,,	3.5	,,
,,	3.8	,,
,,	4.15	,,
,,	4.45	,,
,,	4.75	,,
,,	5.06	,,
18.15	3.8	120
,,	4.15	,,
,,	4.5	,,
,,	4.9	,,
,,	5.3	,,
,,	5.65	,,
,,	6.03	,,
22.83	3.11	110
,,	3.5	,,
,,	3.9	,,
,,	4.25	,,
,,	4.65	,,
,,	5.05	,,
,,	5.45	,,
,,	5.8	,,
,,	6.2	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	3	3	1¼	1	0$\frac{15}{16}$	0⅞
2nd ,, . .	3	3½	1¼	1	1	0$\frac{15}{16}$
3rd ,, . .	4	4	1½	1	1	1
1st Roving .	2	3½	1¼	1	1	1
2nd ,, .	2	4	1½	1	1$\frac{1}{16}$	1⅛
Stretching .	2	4	7	6	1⅛	1¼
This is for Cotton that is 0⅞*in.* in Staple.						
					in.	*in.*
1st Head . .	3	3	1¼	1	1	0$\frac{15}{16}$
2nd ,, . .	3	3½	1¼	1	1	1
3rd ,, . .	4	4	1½	1	1$\frac{1}{16}$	1
1st Roving .	2	3½	1¼	1	1⅛	1$\frac{1}{16}$
2nd ,, . .	2	4	1½	1	1⅛	1⅛
Stretching .	2	4½	7	6	1$\frac{3}{16}$	1¼
This is for Cotton that is 1*in.* in Staple.						
					in.	*in.*
1st Head . .	4	3½	1¼	1	1$\frac{1}{16}$	1
2nd ,, . .	4	3½	1¼	1	1⅛	1$\frac{1}{16}$
3rd ,, . .	4	4	1½	1	1⅛	1⅛
4th ,, . .	4	4½	1½	1	1⅛	1⅛
1st Roving .	2	5	1¾	1	1⅛	1⅛
2nd ,, . .	2	5	2	1	1⅛	1$\frac{3}{16}$
Stretching .	2	5¼	8	7	1¼	1⅜
This is for Cotton that is 1⅛*in.* in Staple.						

For 30 *inch* Cards, draw .66 part more in all, either in drawing, roving or stretching, or a head of drawing at the Carding Engine; the front roller making 1.66 revolutions for Back 1.

TABLE I.—PART III.

For 30 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
17	4	15	18	6	0	9	5
18	4	10	20	6	0	"	
19	4	6	10	5	9	"	
20	4	2	11	5	9	"	
21	3	17	2	5	6	"	
22	3	13	20	5	6	"	

This is allowing 1½oz. in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
23	4	4	13	5	9	9	5
24	4	1	8	5	9	"	
25	3	16	14	5	9	"	
26	3	13	20	5	6	"	
27	3	11	7	5	6	"	
28	3	8	22	5	6	"	
29	3	6	18	5	3	"	
30	3	4	17	5	3	"	

This is allowing 1½oz. in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	4	3	0	75
1⅛	"		"		"		84
1¼	"		"		"		93
1⅜	"		"		"		103
1½	"		"		"		112
1⅝	"		"		"		121
1¾	"		"		"		131
1⅞	"		"		"		140
2	"		"		"		149

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	4	3	0	82
1⅛	"		"		"		91
1¼	"		"		"		101
1⅜	"		"		"		111
1½	"		"		"		121
1⅝	"		"		"		131
1¾	"		"		"		141
1⅞	"		"		"		151
2	"		"		"		161

TABLE I.—PART III.

For 30 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
24	3.11	100
,,	3.5	,,
,,	3.9	,,
,,	4.3	,,
,,	4.65	,,
,,	5.05	90
,,	5.45	,,
,,	5.8	,,
,,	6.2	,,
24	3.37	80
,,	3.79	,,
,,	4.31	,,
,,	4.71	,,
,,	5.15	,,
,,	5.58	70
,,	5.97	,,
,,	6.44	,,
,,	6.87	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving .	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
2nd ,, .	2	5	2	1	$1\frac{3}{16}$	$1\frac{1}{4}$
Stretching .	2	$5\frac{1}{2}$	7	6	$1\frac{1}{4}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{3}{16}$*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{3}{16}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving .	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$
2nd ,, . .	2	5	2	1	$1\frac{1}{4}$	$1\frac{1}{4}$
Stretching .	2	6	8	7	$1\frac{3}{8}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{1}{4}$*in.* in Staple.

TABLE I.—PART IV.

For 36 inch wire.

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	22	0	12	9	0	9	5
2¼	19	10	14	8	3	,,	
2½	17	11	8	7	6	,,	
2¾	16	0	9	6	9	,,	
3	14	12	12	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	16	5	19	9	0	9	5
3½	14	0	2	8	3	,,	
4	12	4	15	7	6	,,	
4½	10	16	7	6	9	,,	
5	9	14	16	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
5	18	7	23	9	0	9	5
5½	16	13	21	8	3	,,	
6	15	5	15	7	6	,,	
6½	14	3	7	6	9	,,	
7	13	3	2	6	5	,,	
7½	12	4	18	6	0	,,	
8	11	9	13				
8½	10	15	8				
9	10	4	10				
9½	9	12	19				
10	9	3	23				
10½	8	14	5				
11	8	6	22				
11½	8	0	7				
12	7	11	10				
12½	7	6	20				
13	7	0	15				
13½	6	15	2				
14	6	10	15				
14½	6	6	12				
15	6	2	15				
15½	5	17	0				
16	5	13	21				

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	4	3	0	54
1⅜	,,		,,		,,		60
1½	,,		,,		,,		65
1⅝	,,		,,		,,		70
1¾	,,		,,		,,		76
1⅞	,,		,,		,,		81
2	,,		,,		,,		87
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	4	3	0	69
1⅜	,,		,,		,,		76
1½	,,		,,		,,		83
1⅝	,,		,,		,,		90
1¾	,,		,,		,,		97
1⅞	,,		,,		,,		104
2	,,		,,		,,		111
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	4	3	0	71
1⅛	,,		,,		,,		80
1¼	,,		,,		,,		89
1⅜	,,		,,		,,		98
1½	,,		,,		,,		107
1⅝	,,		,,		,,		116
1¾	,,		,,		,,		124
1⅞	,,		,,		,,		133
2	,,		,,		,,		142

TABLE I.—PART IV.

For 36 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in.	*in.*
19.21	2.81	130	1st Head . .	3	3	1¼	1	$0\frac{15}{16}$	0⅞
,,	3.12	,,	2nd ,, . .	3	3½	1¼	1	1	$0\frac{15}{16}$
,,	3.36	,,	3rd ,, . .	4	4	1½	1	1	1
,,	3.66	,,	1st Roving	2	3½	1¼	1	1	1
,,	3.97	,,	2nd ,, . .	2	4	1½	1	$1\frac{1}{16}$	1⅛
,,	4.22	,,	Stretching .	2	4	7	6	1⅛	1¼
,,	4.51	,,	This is for Cotton that is 0⅞*in.* in Staple.						
								in	*in.*
20.53	3.36	120	1st Head . .	3	3	1¼	1	1	$0\frac{15}{16}$
,,	3.66	,,	2nd ,, . .	3	3½	1¼	1	1	1
,,	4.03	,,	3rd ,, . .	4	4	1½	1	$1\frac{1}{16}$	1
,,	4.34	,,	1st Roving .	2	3½	1¼	1	1⅛	$1\frac{1}{16}$
,,	4.5	,,	2nd ,, .	2	4	1½	1	1⅛	1⅛
,,	5.01	,,	Stretching .	2	4½	7	6	$1\frac{3}{16}$	1¼
,,	5.38	,,	This is for Cotton that is 1*in.* in Staple.						
								in.	*in.*
25.72	2.76	110	1st Head . .	4	3½	1¼	1	$1\frac{1}{16}$	1
,,	3.11	,,	2nd ,, . .	4	3½	1¼	1	1⅛	$1\frac{1}{16}$
,,	3.46	,,	3rd ,, . .	4	4	1½	1	1⅛	1⅛
,,	3.8	,,	4th ,, . .	4	4½	1½	1	1⅛	1⅛
,,	4.14	,,	1st Roving .	2	5	1½	1	1⅛	1⅛
,,	4.48	,,	2nd ,, . .	2	5	2	1	1⅛	$1\frac{3}{16}$
,,	4.83	,,	Stretching .	2	5¼	8	7	1¼	1⅜
,,	5.17	,,							
,,	5.52	,,	This is for Cotton that is 1⅛*in.* in Staple.						

For 36 *inch* Cards, double heads of drawing, or a head of drawing at the Carding Engine; the front roller making 2 revolutions for Back 1.

TABLE I.—PART IV.

For 36 inch wire.

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
17	5	15	6	6	0	9	5
18	5	9	8	6	0	"	
19	5	4	1	5	9	"	
20	4	17	13	5	9	"	
21	4	13	5	5	6	"	
22	4	9	7	5	6	"	

This is allowing 1⅓*oz.* in the *pound* for waste.

	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
23	5	1	19	5	9	9	5
24	4	16	4	5	9	"	
25	4	12	14	5	9	"	
26	4	9	8	5	6	"	
27	4	6	6	5	6	"	
28	4	3	11	5	6	"	
29	4	0	19	5	3	"	
30	3	16	14	5	3	"	

This is allowing 1⅓*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	6	3	0	75
1⅛	"		"		"		84
1¼	"		"		"		93
1⅜	"		"		"		103
1½	"		"		"		112
1⅝	"		"		"		121
1¾	"		"		"		131
1⅞	"		"		"		140
2	"		"		"		149

in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	6	3	0	82
1⅛	"		"		"		91
1¼	"		"		"		101
1⅜	"		"		"		111
1½	"		"		"		121
1⅝	"		"		"		131
1¾	"		"		"		141
1⅞	"		"		"		151
2	"		"		"		161

TABLE I.—PART IV.

For 36 inch wire.

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
27.17	2.76	100
,,	3.11	,,
,,	3.46	,,
,,	3.8	,,
,,	4.14	,,
,,	4.48	90
,,	4.83	,,
,,	5.17	,,
,,	5.52	,,
27.42	2.99	80
,,	3.37	,,
,,	3.77	,,
,,	4.12	,,
,,	4.51	,,
,,	4.88	70
,,	5.23	,,
,,	5.64	,,
,,	6.01	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	3½	1½	1	1⅛	$1\frac{1}{16}$
2nd ,, . .	4	4	1½	1	1⅛	1⅛
3rd ,, . .	4	4	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	4½	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving	2	4½	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
2nd ,, . .	2	5	2	1	$1\frac{3}{16}$	1¼
Stretching .	2	5½	7	6	1¼	1½

This is for Cotton that is $1\frac{3}{16}$*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	3½	1½	1	1⅛	$1\frac{1}{16}$
2nd ,, . .	4	4	1½	1	$1\frac{3}{16}$	1⅛
3rd ,, . .	4	4	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	4½	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving .	2	4½	1¾	1	1¼	1¼
2nd ,, .	2	5	2	1	1¼	1¼
Stretching .	2	6	8	7	1⅜	1½

This is for Cotton that is 1¼*in.* in Staple.

TABLE I.—PART V.

For 40 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	24	8	16	9	0	9	5
2¼	21	13	18	8	3	,,	
2½	19	10	13	7	6	,,	
2¾	17	14	14	6	9	,,	
3	16	5	18	6	5	,,	
This is allowing 1¾*oz.* in the *pound* for waste.							
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	21	14	8	9	0	9	5
3½	18	12	7	8	3	,,	
4	16	6	5	7	6	,,	
4½	14	9	13	6	9	,,	
5	13	1	8	6	5	,,	
This is allowing 1¾*oz.* in the *pound* for waste.							
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
5	20	8	20	9	0	9	5
5½	18	11	11	8	3	,,	
6	17	1	7	7	6	,,	
6½	15	13	19	6	9	,,	
7	14	11	12	6	5	,,	
7½	13	11	3	6	0	,,	
8	12	14	15				
8½	12	0	21				
9	11	6	22				
9½	10	14	6				
10	10	4	10				
10½	9	13	18				
11	9	5	16				
11½	8	16	5				
12	8	9	21				
12½	8	3	12				
13	7	16	1				
13½	7	10	16				
14	7	5	18				
14½	7	1	3				
15	6	15	2				
15½	6	11	2				
16	6	7	7				
This is allowing 1½*oz.* in the *pound* for waste.							

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	8	3	0	54
1⅜	,,		,,		,,		60
1½	,,		,,		,,		65
1⅝	,,		,,		,,		70
1¾	,,		,,		,,		76
1⅞	,,		,,		,,		81
2	,,		,,		,,		87
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	8	3	0	69
1⅜	,,		,,		,,		76
1½	,,		,,		,,		83
1⅝	,,		,,		,,		90
1¾	,,		,,		,,		97
1⅞	,,		,,		,,		104
2	,,		,,		,,		111
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	8	3	0	71
1⅛	,,		,,		,,		80
1¼	,,		,,		,,		89
1⅜	,,		,,		,,		98
1½	,,		,,		,,		107
1⅝	,,		,,		,,		116
1¾	,,		,,		,,		124
1⅞	,,		,,		,,		133
2	,,		,,		,,		142

TABLE I.—PART V.

For 40 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
21.34	2.53	130
,,	2.79	,,
,,	3.04	,,
,,	3.29	,,
,,	3.54	,,
,,	3.79	,,
,,	4.05	,,
22.62	3.05	120
,,	3.3	,,
,,	3.6	,,
,,	3.9	,,
,,	4.2	,,
,,	4.5	,,
,,	4.8	,,
28.51	2.49	110
,,	2.8	,,
,,	3.11	,,
,,	3.43	,,
,,	3.71	,,
,,	4.05	,,
,,	4.34	,,
,,	4.65	,,
,,	4.97	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	3	3	$1\frac{1}{4}$	1	$0\frac{15}{16}$	$0\frac{7}{8}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
3rd ,, . .	4	4	$1\frac{1}{3}$	1	1	1
1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
2nd ,, .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$
Stretching .	2	4	7	6	$1\frac{1}{8}$	$1\frac{1}{4}$

This is for Cotton that is $0\frac{7}{8}$*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	3	3	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	1
1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
Stretching .	2	$4\frac{1}{2}$	7	6	$1\frac{3}{16}$	$1\frac{1}{4}$

This is for Cotton that is 1*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{16}$	1
2nd ,, . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
3rd ,, . .	4	4	$1\frac{1}{3}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{1}{3}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
1st Roving .	2	5	$1\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
2nd ,, . .	2	5	2	1	$1\frac{1}{8}$	$1\frac{3}{16}$
Stretching .	2	$5\frac{1}{4}$	8	7	$1\frac{1}{4}$	$1\frac{3}{8}$

This is for Cotton that is $1\frac{1}{8}$*in.* in Staple.

For 40 *inch* Cards, double heads of drawing, and a head of drawing at the Carding Engine; the front roller making 1.11 revolutions for Back 1.

TABLE I.—PART V.

For 40 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
17	6	9	2	6	0	9	5
18	6	2	12	6	0	„	
19	5	14	20	5	9	„	
20	5	9	13	5	9	„	
21	5	4	18	5	6	„	
22	4	18	15	5	6	„	

This is allowing 1½*oz.* in the *pound* for waste.

	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
23	5	12	3	5	9	9	5
24	5	7	20	5	9	„	
25	5	3	21	5	9	„	
26	5	0	5	5	6	„	
27	4	15	2	5	6	„	
28	4	11	22	5	6	„	
29	4	9	0	5	3	„	
30	4	6	6	5	3	„	

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	8	3	0	75
1⅛	„		„		„		84
1¼	„		„		„		93
1⅜	„		„		„		103
1½	„		„		„		112
1⅝	„		„		„		121
1¾	„		„		„		131
1⅞	„		„		„		140
2	„		„		„		149

in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	8	3	0	82
1⅛	„		„		„		91
1¼	„		„		„		101
1⅜	„		„		„		111
1½	„		„		„		121
1⅝	„		„		„		131
1¾	„		„		„		141
1⅞	„		„		„		151
2	„		„		„		161

TABLE I.—PART V.

For 40 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
30.12	2.49	100
,,	2.8	,,
,,	3.11	,,
,,	3.43	,,
,,	3.71	,,
,,	4.05	90
,,	4.34	,,
,,	4.65	,,
,,	4.97	,,
30.48	2.69	80
,,	3.03	,,
,,	3.39	,,
,,	3.71	,,
,,	4.06	,,
,,	4.39	70
,,	4.7	,,
,,	5.07	,,
,,	5.41	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	DraftbetweenFront and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	4	3½	1½	1	1⅛	1 1/16
2nd ,, . .	4	4	1½	1	1⅛	1⅛
3rd ,, . .	4	4	1¾	1	1 3/16	1 3/16
4th ,, . .	4	4½	1¾	1	1 3/16	1 3/16
1st Roving .	2	4½	1¾	1	1 3/16	1 3/16
2nd ,, .	2	5	2	1	1 3/16	1¼
Stretching .	2	5½	7	6	1¼	1½

This is for Cotton that is 1 3/16 *in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	DraftbetweenFront and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	4	3½	1½	1	1⅛	1 1/16
2nd ,, . .	4	4	1½	1	1 3/16	1⅛
3rd ,, . .	4	4	1¾	1	1 3/16	1 3/16
4th ,, . .	4	4½	1¾	1	1 3/16	1 3/16
1st Roving .	2	4½	1¾	1	1¼	1¼
2nd ,, . .	2	5	2	1	1¼	1¼
Stretching .	2	6	8	7	1⅜	1½

This is for Cotton that is 1¼ *in.* in Staple.

TABLE I.—PART VI.

For 42 inch wire.

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	25	12	18	9	0	9	5
2¼	22	15	9	8	3	,,	
2½	20	10	5	7	6	,,	
2¾	18	12	14	6	9	,,	
3	17	2	10	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	22	16	0	9	0	9	5
3½	19	11	2	8	3	,,	
4	17	2	21	7	6	,,	
4½	15	4	14	6	9	,,	
5	13	13	5	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
5	21	9	7	9	0	9	5
5½	19	10	2	8	3	,,	
6	17	16	2	7	6	,,	
6½	16	9	21	6	9	,,	
7	15	6	13	6	5	,,	
7½	14	6	4	6	0	,,	
8	13	8	2				
8½	12	11	21				
9	11	17	8				
9½	11	5	18				
10	10	13	18				
10½	10	4	18				
11	9	14	4				
11½	9	6	10				
12	8	17	13				
12½	8	11	0				
13	8	4	2				
13½	7	17	10				
14	7	12	10				
14½	7	7	14				
15	7	3	2				
15½	6	17	2				
16	6	13	3				

This is allowing 1⅓*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	10	3	0	54
1⅜	,,		,,		,,		60
1½	,,		,,		,,		65
1⅝	,,		,,		,,		70
1¾	,,		,,		,,		76
1⅞	,,		,,		,,		81
2	,,		,,		,,		87
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	1	1	10	3	0	69
1⅜	,,		,,		,,		76
1½	,,		,,		,,		83
1⅝	,,		,,		,,		90
1¾	,,		,,		,,		97
1⅞	,,		,,		,,		104
2	,,		,,		,,		111
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	10	3	0	71
1⅛	,,		,,		,,		80
1¼	,,		,,		,,		89
1⅜	,,		,,		,,		98
1½	,,		,,		,,		107
1⅝	,,		,,		,,		116
1¾	,,		,,		,,		124
1⅞	,,		,,		,,		133
2	,,		,,		,,		142

TABLE I.—PART VI.

For 42 inch wire.

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in.	*in.*
23.48	2.3	130	1st Head . .	3	3	$1\frac{1}{4}$	1	$0\frac{15}{16}$	$0\frac{7}{8}$
,,	2.55	,,	2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
,,	2.75	,,	3rd ,, . .	4	4	$1\frac{1}{2}$	1	1	1
,,	3.	,,	1st Roving	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
,,	3.25	,,	2nd ,, . .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$
,,	3.45	,,	Stretching .	2	4	7	6	$1\frac{1}{8}$	$1\frac{1}{4}$
,,	4.05	,,							

This is for Cotton that is $0\frac{7}{8}$*in.* in Staple.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in	*in.*
25	2.75	120	1st Head . .	3	3	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
,,	3.	,,	2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
,,	3.3	,,	3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	1
,,	3.55	,,	1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
,,	3.85	,,	2nd ,, .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	4.1	,,	Stretching .	2	$4\frac{1}{2}$	7	6	$1\frac{3}{16}$	$1\frac{1}{4}$
,,	4.4	,,							

This is for Cotton that is 1*in.* in Staple.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in.	*in.*
31.27	2.27	110	1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{16}$	1
,,	2.55	,,	2nd ,, . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
,,	2.85	,,	3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	3.1	,,	4th ,, . .	4	$4\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	3.4	,,	1st Roving .	2	5	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	3.7	,,	2nd ,, . .	2	5	2	1	$1\frac{1}{8}$	$1\frac{3}{16}$
,,	3.95	,,	Stretching .	2	$5\frac{1}{4}$	8	7	$1\frac{1}{4}$	$1\frac{3}{8}$
,,	4.25	,,							
,,	4.55	,,							

This is for Cotton that is $1\frac{1}{8}$*in.* in Staple.

For 40 *inch* Cards, double heads of drawing, and a head of drawing at the Carding Engine; the front roller making 1.16 revolutions for Back 1.

TABLE I.—PART VI.

For 42 inch wire.

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
17	6	14	18	6	0	9	5
18	6	7	21	6	0	”	
19	6	1	17	5	9	”	
20	5	14	9	5	9	”	
21	5	9	8	5	6	”	
22	5	4	19	5	6	”	

This is allowing 1½*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
23	5	17	7	5	9	9	5
24	5	12	19	5	9	”	
25	5	8	15	5	9	”	
26	5	4	19	5	6	”	
27	5	1	6	5	6	”	
28	4	16	4	5	6	”	
29	4	13	2	5	3	”	
30	4	10	5	5	3	”	

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	10	3	0	75
1⅛	”		”		”		84
1¼	”		”		”		93
1⅜	”		”		”		103
1½	”		”		”		112
1⅝	”		”		”		121
1¾	”		”		”		131
1⅞	”		”		”		140
2	”		”		”		149

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	1	1	10	3	0	82
1⅛	”		”		”		91
1¼	”		”		”		101
1⅜	”		”		”		111
1½	”		”		”		121
1⅝	”		”		”		131
1¾	”		”		”		141
1⅞	”		”		”		151
2	”		”		”		161

TABLE I.—PART VI.

For 42 inch wire.

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
33	2.27	100
,,	2.55	,,
,,	2.85	,,
,,	3.1	,,
,,	3.4	,,
,,	3.7	90
,,	3.95	,,
,,	4.25	,,
,,	4.55	,,
33.19	2.44	80
,,	2.75	,,
,,	3.08	,,
,,	3.37	,,
,,	3.69	,,
,,	3.99	70
,,	4.27	,,
,,	4.61	,,
,,	4.92	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Boller.	Distance between Front and Middle Roller. in.	Distance between Back and Middle Roller. in.
1st Head . .	4	3½	1½	1	1⅛	$1\frac{1}{16}$
2nd ,, . .	4	4	1½	1	1⅛	1⅛
3rd ,, . .	4	4	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	4½	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving	2	4½	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
2nd ,, . .	2	5	2	1	$1\frac{3}{16}$	1¼
Stretching .	2	5½	7	6	1¼	1½

This is for Cotton that is $1\frac{3}{16}$*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Boller.	Distance between Front and Middle Roller. in.	Distance between Back and Middle Roller. in.
1st Head . .	4	3½	1½	1	1⅛	$1\frac{1}{16}$
2nd ,, . .	4	4	1½	1	$1\frac{3}{16}$	1⅛
3rd ,, . .	4	4	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	4½	1¾	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving .	2	4½	1¾	1	1¼	1¼
2nd ,, .	2	5	2	1	1¼	1¼
Stretching .	2	6	8	7	1⅜	1½

This is for Cotton that is 1¼*in.* in Staple.

TABLE I.—PART VII.

For 44 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	26	16	9	9	0	9	5
2¼	24	3	9	8	3	,,	
2½	21	13	23	7	6	,,	
2¾	19	14	8	6	9	,,	
3	18	2	12	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	23	17	15	9	0	9	5
3½	20	9	21	8	3	,,	
4	17	17	18	7	6	,,	
4½	15	17	19	6	9	,,	
5	14	6	22	6	5	,,	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
5	22	10	4	9	0	9	5
5½	20	9	5	8	3	,,	
6	18	14	13	7	6	,,	
6½	17	6	10	6	9	,,	
7	16	2	4	6	5	,,	
7½	15	0	16	6	0	,,	
8	14	1	19				
8½	13	4	21				
9	12	9	17				
9½	11	15	21				
10	11	5	2				
10½	10	13	12				
11	10	4	15				
11½	9	14	17				
12	9	7	6				
12½	9	0	10				
13	8	12	7				
13½	8	6	11				
14	8	1	0				
14½	7	14	4				
15	7	9	11				
15½	7	5	1				
16	7	0	21				

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	4	1	10	3	0	50
1⅜	,,		,,		,,		55
1½	,,		,,		,,		60
1⅝	,,		,,		,,		65
1¾	,,		,,		,,		70
1⅞	,,		,,		,,		75
2	,,		,,		,,		80

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	4	1	10	3	0	64
1⅜	,,		,,		,,		70
1½	,,		,,		,,		77
1⅝	,,		,,		,,		83
1¾	,,		,,		,,		89
1⅞	,,		,,		,,		96
2	,,		,,		,,		101

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	4	1	10	3	0	68
1⅛	,,		,,		,,		74
1¼	,,		,,		,,		82
1⅜	,,		,,		,,		90
1½	,,		,,		,,		99
1⅝	,,		,,		,,		107
1¾	,,		,,		,,		114
1⅞	,,		,,		,,		123
2	,,		,,		,,		132

TABLE I.—PART VII.

For 44 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
21.74	2.3	130
,,	2.55	,,
,,	2.75	,,
,,	3.	,,
,,	3.25	,,
,,	3.45	,,
,,	4.05	,,
23.27	2.75	120
,,	3.	,,
,,	3.3	,,
,,	3.55	,,
,,	3.85	,,
,,	4.1	,,
,,	4.4	,,
29.95	2.27	110
,,	2.55	,,
,,	2.85	,,
,,	3.1	,,
,,	3.4	,,
,,	3.7	,,
,,	3.95	,,
,,	4.25	,,
,,	4.55	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	3	3	$1\frac{1}{4}$	1	$0\frac{15}{16}$	$0\frac{7}{8}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
3rd ,, . .	4	4	$1\frac{1}{2}$	1	1	1
1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
2nd ,, .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$
Stretching .	2	4	7	6	$1\frac{1}{8}$	$1\frac{1}{4}$

This is for Cotton that is $0\frac{7}{8}$*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	3	3	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	1
1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
Stretching .	2	$4\frac{1}{2}$	7	6	$1\frac{3}{16}$	$1\frac{1}{4}$

This is for Cotton that is 1*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{16}$	1
2nd ,, . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
1st Roving .	2	5	$1\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
2nd ,, . .	2	5	2	1	$1\frac{1}{8}$	$1\frac{3}{16}$
Stretching .	2	$5\frac{1}{4}$	8	7	$1\frac{1}{4}$	$1\frac{3}{8}$

This is for Cotton that is $1\frac{1}{8}$*in.* in Staple.

For 44 *inch* Cards, double heads of drawing, and a head of drawing at the Carding Engine; the front roller making 1.22 revolutions for Back 1.

TABLE I.—PART VII.

For 44 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.	Length of Feed for Breakers.	Length of Feed for Finishers
	oz. dwt. gr.	*ft. in.*	*ft. in.*
17	7 2 20	6 0	9 5
18	6 13 10	6 0	"
19	6 6 23	5 9	"
20	6 1 3	5 9	"
21	5 14 2	5 6	"
22	5 9 8	5 6	"

This is allowing 1½*oz.* in the *pound* for waste.

	oz. dwt. gr.	*ft. in.*	*ft. in.*
23	6 4 5	5 9	9 5
24	5 17 18	5 9	"
25	5 13 9	5 9	"
26	5 9 9	5 6	"
27	5 5 15	5 6	"
28	5 2 4	5 6	"
29	4 17 5	5 3	"
30	4 14 4	5 3	"

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.	Diameter of Doffing Cylinder.	Diameter of Lap Drum.	Revolution of Main Cylinder for Feed Roller one.
in.	*ft. in.*	*ft. in.*	*ft. in.*	
1	3 4	1 10	3 0	70
1⅛	"	"	"	79
1¼	"	"	"	88
1⅜	"	"	"	97
1½	"	"	"	106
1⅝	"	"	"	115
1¾	"	"	"	124
1⅞	"	"	"	133
2	"	"	"	142

in.	*ft. in.*	*ft. in.*	*ft. in.*	
1	3 4	1 10	3 0	76
1⅛	"	"	"	84
1¼	"	"	"	93
1⅜	"	"	"	102
1½	"	"	"	112
1⅝	"	"	"	121
1¾	"	"	"	131
1⅞	"	"	"	140
2	"	"	"	149

TABLE I.—PART VII.

For 44 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
30.83	2.27	100
,,	2.55	,,
,,	2.85	,,
,,	3.1	,,
,,	3.4	,,
,,	3.7	90
,,	3.95	,,
,,	4.25	,,
,,	4.55	,,
31.14	2.44	80
,,	2.75	,,
,,	3.08	,,
,,	3.37	,,
,,	3.69	,,
,,	3.99	70
,,	4.27	,,
,,	4.61	,,
,,	4.92	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{1}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving.	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
2nd ,, .	2	5	2	1	$1\frac{3}{16}$	$1\frac{1}{4}$
Stretching .	2	$5\frac{1}{2}$	7	6	$1\frac{1}{4}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{3}{16}$*in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{3}{16}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{1}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving.	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$
2nd ,, . .	2	5	2	1	$1\frac{1}{4}$	$1\frac{1}{4}$
Stretching .	2	6	8	7	$1\frac{3}{8}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{1}{4}$*in.* in Staple.

TABLE I.—PART VIII.

For 46 inch wire.

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	28	2	16	9	0	9	5
2¼	25	0	8	8	3	,,	
2½	22	9	10	7	6	,,	
2¾	20	8	13	6	9	,,	
3	18	13	22	6	5	,,	
This is allowing 1¾*oz.* in the *pound* for waste.							
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	25	1	0	9	0	9	5
3½	21	8	16	8	3	,,	
4	18	14	10	7	6	,,	
4½	16	12	20	6	9	,,	
5	15	0	14	6	5	,,	
This is allowing 1¾*oz.* in the *pound* for waste.							
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
5	23	10	15	9	0	9	5
5½	21	8	0	8	3	,,	
6	19	11	21	7	6	,,	
6½	18	2	11	6	9	,,	
7	16	15	9	6	5	,,	
7½	15	13	3	6	0	,,	
8	14	13	11				
8½	13	15	21				
9	13	1	20				
9½	12	7	12				
10	11	14	10				
10½	11	4	4				
11	10	13	2				
11½	10	4	15				
12	9	15	2				
12½	9	7	21				
13	9	1	6				
13½	8	13	9				
14	8	7	16				
14½	8	2	9				
15	7	15	16				
15½	7	11	1				
16	7	6	17				
This is allowing 1½*oz.* in the *pound* for waste.							

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	2	10	1	8	3	0	58
1⅜	,,		,,		,,		64
1½	,,		,,		,,		69
1⅝	,,		,,		,,		75
1¾	,,		,,		,,		80
1⅞	,,		,,		,,		86
2	,,		,,		,,		92
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	2	10	1	8	3	0	75
1⅜	,,		,,		,,		82
1½	,,		,,		,,		89
1⅝	,,		,,		,,		96
1¾	,,		,,		,,		103
1⅞	,,		,,		,,		110
2	,,		,,		,,		117
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	2	10	1	8	3	0	77
1⅛	,,		,,		,,		86
1¼	,,		,,		,,		95
1⅜	,,		,,		,,		104
1½	,,		,,		,,		113
1⅝	,,		,,		,,		122
1¾	,,		,,		,,		131
1⅞	,,		,,		,,		140
2	,,		,,		,,		149

TABLE I.—PART VIII.

For 46 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.	Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
								in.	in.
22.92	2.53	130	1st Head . .	3	3	$1\frac{1}{4}$	1	$0\frac{15}{16}$	$0\frac{7}{8}$
,,	2.79	,,	2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
,,	3.04	,,	3rd ,, . .	4	4	$1\frac{1}{2}$	1	1	1
,,	3.29	,,	1st Roving	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
,,	3.54	,,	2nd ,, . .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$
,,	3.79	,,	Stretching .	2	4	7	6	$1\frac{1}{8}$	$1\frac{1}{4}$
,,	4.05	,,	This is for Cotton that is $0\frac{7}{8}$*in.* in Staple.						
								in	in.
24.59	3.05	120	1st Head . .	3	3	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
,,	3.3	,,	2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
,,	3.6	,,	3rd ,, . .	4	4	$1\frac{1}{3}$	1	$1\frac{1}{16}$	1
,,	3.9	,,	1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
,,	4.2	,,	2nd ,, .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	4.5	,,	Stretching .	2	$4\frac{1}{2}$	7	6	$1\frac{3}{16}$	$1\frac{1}{4}$
,,	4.8	,,	This is for Cotton that is 1*in.* in Staple.						
								in.	in.
30.92	2.49	110	1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{16}$	1
,,	2.8	,,	2nd ,, . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
,,	3.11	,,	3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	3.43	,,	4th ,, . .	4	$4\frac{1}{3}$	$1\frac{1}{3}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	3.71	,,	1st Roving .	2	5	$1\frac{1}{3}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
,,	4.05	,,	2nd ,, . .	2	5	2	1	$1\frac{1}{8}$	$1\frac{3}{16}$
,,	4.34	,,	Stretching .	2	$5\frac{1}{4}$	8	7	$1\frac{1}{4}$	$1\frac{3}{8}$
,,	4.65	,,							
,,	4.97	,,	This is for Cotton that is $1\frac{1}{8}$*in.* in Staple.						

For 46 *inch* Cards, double heads of drawing, and a head of drawing at the Carding Engine; the front roller making 1.28 revolutions for Back 1.

TABLE I.—PART VIII.

For 46 inch wire.

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
17	7	8	8	6	0	9	5
18	7	0	18	6	0	,,	
19	6	12	6	5	9	,,	
20	6	6	4	5	9	,,	
21	6	0	16	5	6	,,	
22	5	13	21	5	6	,,	

This is allowing 1½*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
23	6	9	9	5	9	9	5
24	6	4	10	5	9	,,	
25	5	18	2	5	9	,,	
26	5	13	21	5	6	,,	
27	5	10	0	5	6	,,	
28	5	6	9	5	6	,,	
29	5	3	11	5	3	,,	
30	5	0	7	5	3	,,	

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	2	10	1	8	3	0	81
1⅛	,,		,,		,,		90
1¼	,,		,,		,,		99
1⅜	,,		,,		,,		109
1½	,,		,,		,,		118
1⅝	,,		,,		,,		127
1¾	,,		,,		,,		137
1⅞	,,		,,		,,		146
2	,,		,,		,,		156

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	2	10	1	8	3	0	85
1⅛	,,		,,		,,		95
1¼	,,		,,		,,		105
1⅜	,,		,,		,,		115
1½	,,		,,		,,		125
1⅝	,,		,,		,,		135
1¾	,,		,,		,,		145
1⅞	,,		,,		,,		155
2	,,		,,		,,		165

TABLE I.—PART VIII.

For 46 inch wire.

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
32.53	2.49	100
,,	2.8	,,
,,	3.11	,,
,,	3.43	,,
,,	3.71	,,
,,	4.05	90
,,	4.34	,,
,,	4.65	,,
,,	4.97	,,
31.6	2.69	80
,,	3.03	,,
,,	3.39	,,
,,	3.71	,,
,,	4.06	,,
,,	4.39	70
,,	4.7	,,
,,	5.07	,,
,,	5.41	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draftbetween Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	3½	1½	1	1⅛	1 1/16
2nd ,, . .	4	4	1½	1	1⅛	1⅛
3rd ,, . .	4	4	1¾	1	1 3/16	1 3/16
4th ,, . .	4	4½	1¾	1	1 3/16	1 3/16
1st Roving	2	4½	1¾	1	1 3/16	1 3/16
2nd ,, . .	2	5	2	1	1 3/16	1¼
Stretching .	2	5½	7	6	1¼	1½

This is for Cotton that is 1 3/16 *in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draftbetween Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	3½	1½	1	1⅛	1 1/16
2nd ,, . .	4	4	1½	1	1 3/16	1⅛
3rd ,, . .	4	4	1¾	1	1 3/16	1 3/16
4th ,, . .	4	4½	1¾	1	1 3/16	1 3/16
1st Roving .	2	4½	1¾	1	1¼	1¼
2nd ,, .	2	5	2	1	1¼	1¼
Stretching .	2	6	8	7	1⅜	1½

This is for Cotton that is 1¼*in.* in Staple.

TABLE I.—PART IX.

For 48 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed fo Breakers.		Length of Feed fo Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
2	29	6	18	9	0	9	5
2¼	26	1	23	8	3	"	
2½	23	9	1	7	6	"	
2¾	21	6	1	6	9	"	
3	19	10	14	6	5	"	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed fo Breakers.		Length of Feed fo Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
3	26	2	15	9	0	9	5
3½	22	7	11	8	3	"	
4	19	11	2	7	6	"	
4½	17	7	20	6	9	"	
5	15	12	12	6	5	"	

This is allowing 1¾*oz.* in the *pound* for waste.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed fo Breakers.		Length of Feed fo Finishers.	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
5	24	10	15	9	0	9	5
5½	22	6	8	8	3	"	
6	20	8	20	7	6	"	
6½	18	16	14	6	9	"	
7	17	10	4	6	5	"	
7½	16	7	2	6	0	"	
8	15	6	15				
8½	14	8	9				
9	13	11	23				
9½	12	17	2				
10	12	5	7				
10½	11	13	1				
11	11	3	4				
11½	10	12	13				
12	10	4	10				
12½	9	15	4				
13	9	8	7				
13½	9	1	21				
14	8	14	5				
14½	8	8	16				
15	8	3	13				
15½	7	16	22				
16	7	12	10				

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	4	1	10	3	0	50
1⅜	"		"		"		55
1½	"		"		"		60
1⅝	"		"		"		65
1¾	"		"		"		70
1⅞	"		"		"		75
2	"		"		"		80

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1¼	3	4	1	10	3	0	64
1⅜	"		"		"		70
1½	"		"		"		77
1⅝	"		"		"		83
1¾	"		"		"		89
1⅞	"		"		"		96
2	"		"		"		101

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	4	1	10	3	0	68
1⅛	"		"		"		74
1¼	"		"		"		82
1⅜	"		"		"		90
1½	"		"		"		99
1⅝	"		"		"		107
1¾	"		"		"		114
1⅞	"		"		"		123
2	"		"		"		132

TABLE I.—PART IX.

For 48 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolutions of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
21.74	2.3	130
,,	2.55	,,
,,	2.75	,,
,,	3.	,,
,,	3.25	,,
,,	3.45	,,
,,	4.05	,,
23.27	2.75	120
,,	3.	,,
,,	3.3	,,
,,	3.55	,,
,,	3.85	,,
,,	4.1	,,
,,	4.4	,,
29.95	2.27	110
,,	2.55	,,
,,	2.85	,,
,,	3.1	,,
,,	3.4	,,
,,	3.7	,,
,,	3.95	,,
,,	4.25	,,
,,	4.55	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	*in.*
1st Head . .	3	3	$1\frac{1}{4}$	1	$0\frac{15}{16}$	$0\frac{7}{8}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
3rd ,, . .	4	4	$1\frac{1}{2}$	1	1	1
1st Roving	2	$3\frac{1}{8}$	$1\frac{1}{3}$	1	1	1
2nd ,, . .	2	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$
Stretching .	2	4	7	6	$1\frac{1}{8}$	$1\frac{1}{4}$

This is for Cotton that is $0\frac{7}{8}$*in.* in Staple.

					in.	*in.*
1st Head . .	3	3	$1\frac{1}{4}$	1	1	$0\frac{15}{16}$
2nd ,, . .	3	$3\frac{1}{2}$	$1\frac{1}{4}$	1	1	1
3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{16}$	1
1st Roving .	2	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, .	2	4	$1\frac{1}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
Stretching .		$4\frac{1}{2}$	7	6	$1\frac{3}{16}$	$1\frac{1}{4}$

This is for Cotton that is 1*in.* in Staple.

					in.	*in.*
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{16}$	1
2nd ,, . .	4	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
3rd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
4th ,, . .	4	$4\frac{1}{8}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
1st Roving .	2	5	$1\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
2nd ,,	2	5	2	1	$1\frac{1}{8}$	$1\frac{3}{16}$
Stretching	2	$5\frac{1}{4}$	8	7	$1\frac{1}{4}$	$1\frac{3}{4}$

This is for Cotton that is $1\frac{1}{8}$*in.* in Staple.

For 48 *inch* Cards, double heads of drawing, and a head of drawing at the Carding Engine; the front roller making 1.33 revolutions for Back 1.

TABLE I.—PART IX.

For 48 *inch wire.*

No. 1 Division.

Number of Hanks of Roving.	Weight of Cotton to be put on the Cards.			Length of Feed for Breakers.		Length of Feed for Finishers	
	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
17	7	14	7	6	0	9	5
18	7	5	13	6	0	,,	
19	6	17	14	5	9	,,	
20	6	11	5	5	9	,,	
21	6	4	15	5	6	,,	
22	6	0	6	5	6	,,	

This is allowing 1½*oz.* in the *pound* for waste.

	oz.	*dwt.*	*gr.*	*ft.*	*in.*	*ft.*	*in.*
23	6	14	14	5	9	9	5
24	6	9	10	5	9	,,	
25	6	4	16	5	9	,,	
26	6	0	6	5	6	,,	
27	5	14	11	5	6	,,	
28	5	10	16	5	6	,,	
29	5	7	4	5	3	,,	
30	5	3	21	5	3	,,	

This is allowing 1½*oz.* in the *pound* for waste.

No. 2 Division.

Diameter of Feed Roller.	Diameter of Main Cylinder.		Diameter of Doffing Cylinder.		Diameter of Lap Drum.		Revolution of Main Cylinder for Feed Roller one.
in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	4	1	10	3	0	70
1⅛	,,		,,		,,		79
1¼	,,		,,		,,		88
1⅜	,,		,,		,,		97
1½	,,		,,		,,		106
1⅝	,,		,,		,,		115
1¾	,,		,,		,,		124
1⅞	,,		,,		,,		133
2	,,		,,		,,		142

in.	*ft.*	*in.*	*ft.*	*in.*	*ft.*	*in.*	
1	3	4	1	10	3	0	75
1⅛	,,		,,		,,		84
1¼	,,		,,		,,		93
1⅜	,,		,,		,,		102
1½	,,		,,		,,		112
1⅝	,,		,,		,,		121
1¾	,,		,,		,,		131
1⅞	,,		,,		,,		140
2	,,		,,		,,		149

TABLE I.—PART IX.

For 48 *inch wire.*

No. 3 Division.

Revolution of Main Cylinder for Doffer one.	Revolution of Doffing Cylinder for Feed Roller one.	Revolution of Main Cylinder per Minute.
30.83	2.27	100
,,	2.55	,,
,,	2.85	,,
,,	3.1	,,
,,	3.4	,,
,,	3.7	90
,,	3.95	,,
,,	4.25	,,
,,	4.55	,,
31.14	2.44	80
,,	2.75	,,
,,	3.08	,,
,,	3.37	,,
,,	3.69	,,
,,	3.99	70
,,	4.27	,,
,,	4.61	,,
,,	4.92	,,

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving .	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
2nd ,, .	2	5	2	1	$1\frac{3}{16}$	$1\frac{1}{4}$
Stretching .	2	$5\frac{1}{2}$	7	6	$1\frac{1}{4}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{3}{16}$ *in.* in Staple.

Heads of Drawing, with Roving and Stretching.	Ends put up.	Draft between Front and Back Roller.	Draft between Back and Middle Roller.	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
					in.	in.
1st Head . .	4	$3\frac{1}{2}$	$1\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{1}{16}$
2nd ,, . .	4	4	$1\frac{1}{2}$	1	$1\frac{3}{16}$	$1\frac{1}{8}$
3rd ,, . .	4	4	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
4th ,, . .	4	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$1\frac{3}{16}$
1st Roving .	2	$4\frac{1}{2}$	$1\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$
2nd ,, . .	2	5	2	1	$1\frac{1}{4}$	$1\frac{1}{4}$
Stretching .	2	6	8	7	$1\frac{3}{8}$	$1\frac{1}{2}$

This is for Cotton that is $1\frac{1}{4}$ *in.* in Staple.

SECOND

OR

STRETCHING FRAME TABLE.

Shewing what numbers of rovings can be produced from 1 to 32½ hanks in the pound, from coarse rovings of ¼ to 5 hanks in the pound, with 6 different drafs in the rollers, commencing with a draft of 4 and advancing progressively, that with ½ a draft the common difference up to 6½ both inclusive, with the proper quantity of twist for each number.

TABLE II.—PART I.

Draft of 4 *to* 4½.

Draft of 4. Draft of 4½

Number of hanks in a pound of coarse rovings.	Number of hanks in a pound of fine rovings.	Revolutions of spindle for the rim or handle one.	Revolutions of the rim or handle in a stretch	Revolutions of the spindle in one inch.	Number of hanks in a pound of coarse rovings	Number of hanks in a pound of fine rovings	Revolutions of spindle for the rim or handle one	Revolutions of the rim or handle in a stretch.	Revolutions of the spindle in one inch.
0¼	1	5	7	.6	0¼	1⅛	6	7	.7
0½	2	6	8	.9	0½	2¼	6	8	.9
0¾	3	7	9	1.1	0¾	3⅜	7	9	1.1
1	4	8	9	1.3	1	4½	7	10	1.3
1¼	5	8	10	1.4	1¼	5⅝	7	11	1.4
1½	6	9	,,	1.6	1½	6¾	7	12	1.5
1¾	7	9	11	1.8	1¾	7⅞	8	,,	1.7
2	8	9	12	2.	2	9	8	13	1.9
2¼	9	9	13	2.1	2¼	10⅛	9	12	2.
2½	10	9	14	2.3	2½	11¼	10	,,	2.2
2¾	11	10	,,	2.5	2¾	12⅜	11	,,	2.4
3	12	10	15	2.7	3	13½	,,	13	2.6
3¼	13	10	16	2.9	3¼	14⅝	,,	14	2.8
3½	14	11	,,	3.2	3½	15¾	,,	15	3.
3¾	15	,,	17	3.4	3¾	16⅞	,,	16	3.2
4	16	,,	18	3.6	4	18	12	,,	3.5
4¼	17	,,	19	3.8	4¼	19⅛	,,	17	3.8
4½	18	,,	20	4.	4½	20¼	,,	18	4.
4¾	19	,,	21	4.2	4¾	21⅜	,,	20	4.4
5	20	,,	22	4.4	5	22½	,,	21	4.6

TABLE II.—PART II.

Draft of 5 to 6½.

Draft of 5.

Nnmber of Hanks in a pound of coarse rovings.	Number of Hanks in a pound of fine rovings.	Revolutions of spindle for the rim or handle one.	Revolutions of the rim or handle in a stretch.	Revolutions of the spindle in one inch.
0¼	1¼	6	7	.7
0½	2½	6	8	.9
0¾	3¾	7	9	1.1
1	5	8	9	1.3
1¼	6¼	8	10	1.4
1½	7½	9	,,	1.6
1¾	8¾	9	11	1.8
2	10	10	12	2.2
2¼	11¼	11	,,	2.4
2½	12½	,,	13	2.6
2¾	13¾	,,	14	2.8
3	15	,,	15	3.
3¼	16¼	,,	16	3.2
3½	17½	12	,,	3.5
3¾	18¾	,,	17	3.7
4	20	13	,,	4.
4¼	21¼	,,	18	4.2
4½	22½	14	17	4.4
4¾	23¾	,,	18	4.6
5	25	,,	19	4.9

Draft of 6.

Number of Hanks in a pound of coarse rovings.	Number of Hanks in a pound of fine rovings.	Revolutions of spin dle for the rim or handle one.	Revolutions of the rim or handle in a stretch.	Revolutions of the spindle in one inch.
0¼	1½	6	8	.9
0½	3	7	9	1.1
0¾	4½	8	9	1.3
1	6	7	11	1.4
1¼	7½	8	,,	1.6
1½	9	9	,,	1,8
1¾	10½	9	12	2.
2	12	10	,,	2.2
2¼	13½	,,	13	2.4
2½	15	11	,,	2.6
2¾	16½	,,	14	2.8
3	18	,,	15	3.
3¼	19½	,,	16	3.2
3½	21	12	,,	3.5
3¾	22½	13	17	4.
4	24	14	,,	4.4
4¼	25½	,,	18	4.6
4½	27	,,	19	4.9
4¾	28½	15	,,	5,2
5	30	15	20	5.5

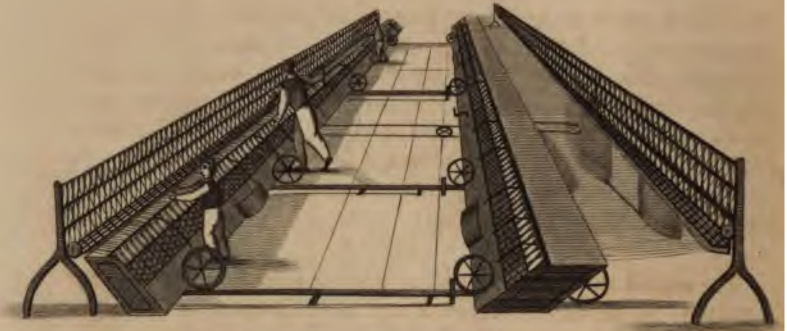
Draft of 5½.

Nnmber of Hanks in a pound of coarse rovings.	Number of Hanks in a pound of fine rovings.	Revolutions of spindle for the rim or handle one.	Revolutions of the rim or handle in a stretch.	Revolutions of the spindle in one inch.
0¼	1⅜	6	7	.8
0½	2¾	6	9	1.
0¾	4⅛	7	9	1.1
1	5½	8	10	1.4
1¼	6⅞	9	,,	1.6
1½	8¼	9	11	1.8
1¾	9⅝	9	12	2.
2	11	10	,,	2.2
2¼	12⅜	11	13	2.6
2½	13¾	,,	14	2.8
2¾	15⅛	,,	15	3.
3	16½	,,	16	3.2
3¼	17⅞	12	,,	3.5
3½	19¼	,,	17	3.7
3¾	20⅝	,,	18	4.
4	22	13	18	4.3
4¼	23⅜	,,	19	4.6
4½	24¾	14	19	4.9
4¾	26⅛	15	19	5·2
5	27½	,,	20	5.5

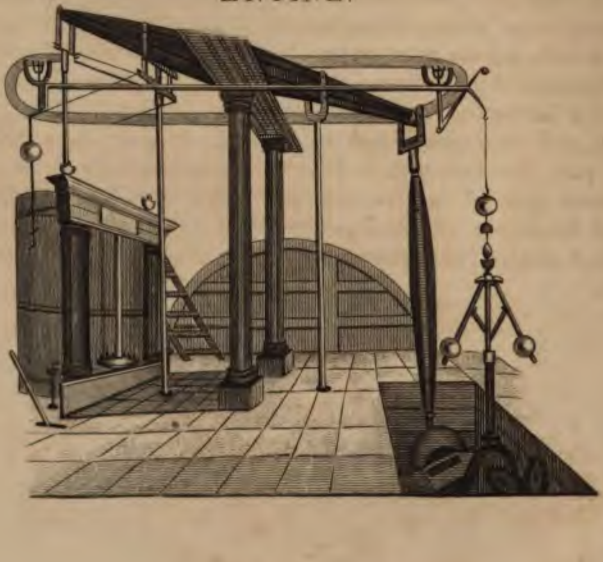
Draft of 6½.

Number of Hanks in a pound of coarse rovings.	Number of Hanks in a pound of fine rovings.	Revolutions of spin dle for the rim or handle one.	Revolutions of the rim or handle in a stretch.	Revolutions of the spindle in one inch.
0¼	1⅝	6	8	9.
0½	3¼	7	9	1.1
0¾	4⅞	8	9	1.3
1	6½	8	10	1.4
1¼	8⅛	9	11	1.8
1½	9¾	9	12	2·0
1¾	11⅜	10	,,	2.2
2	13	11	13	2.6
2¼	14⅝	,,	14	2.8
2½	16¼	,,	16	3.2
2¾	17⅞	12	,,	3.5
3	19½	,,	17	3.7
3¼	21⅛	,,	18	4.
3½	22¾	,,	20	4.4
3¾	24⅜	13	,,	4.8
4	26	14	,,	5.1
4¼	27⅝	,,	21	5.4
4½	29¼	15	,,	5.8
4¾	30⅞	,,	22	6.1
5	32½	,,	23	6.4

MULES.



ENGINE.



Simpson Engr. Manchr.

SECOND

OR

SPINNING TABLE,

The first shews what numbers of yarns can be produced from 6 to 351 hanks in the pound, from rovings of from 1 to 31 hanks in the pound, with the inches delivered by the rollers, the proper quantity of gaining and stretching to each part and number, with 8 different drafts in the rollers. This table is in two parts, the first of which shews a draft of 6, 7, 8, and 9, in the rollers, and is for single roving spinning; the second shews a draft of 9, 10, 11 and 12, in the rollers and is for double roving spinning.

The second shews the method of making yarns of seven different qualities, to answer the different sorts of cloth that is made viz:—two of soft weft, two of hard weft, one of reeled twist, and two of cop twist or warp, from 10 to 320 hanks in the pound, with the proper quantity of twist for each number, It consists of 24 parts, each part contains eleven columns, and shews the number of inches delivered by the rollers, the inches gained and stretched, the length of the stretch, and the revolutions of the rim or handle throughout the different stages of the process; also the revolutions of the spindle for the rim or handle one, and the revolutions of the spindle in the production, and completion of each inch of yarn. It is also calculated to make yarn by twenty-three different methods.—three of which commence with 17 twist in one inch—three with 18 do.—three with 19 do.—three with 21 do.—three with 22 do. and eight with 23 do. Each method will answer for small, middle and large sized wheels.

◆

TABLE I.—PART I.

For Single Roving Spinning.

Number of Hanks in a pound of Rovings.	Inches delivered by the rollers.	Inches gained and stretched.	Length of the stretch	No. of hanks in a pound of yarn with a draft of 6.	No. of hanks in a pound of yarn with a draft of 7.	No. of hanks in a pound of yarn with a draft of 8	No. of hanks in a pound of yarn with a draft of 9.
1	54	2	56	6	7	8	9
2	54	2	,,	12	14	16	18
3	53	3	,,	19	22	25	28
4	52	4	,,	26	30	34	38
5	52	4	,,	32	37	43	48
6	51	5	,,	39	46	52	59
7	50	6	,,	47	54	62	70
8	50	6	,,	53	62	71	80
9	49	7	,,	61	72	82	92
10	49	7	,,	68	80	91	102
11	49	7	,,	75	88	100	113
12	48	8	,,	84	98	112	126
13	48	8	,,	91	106	121	136
14	48	8	,,	98	114	130	147
15	46	9	55	107	125	143	161
16	46	9	,,	114	134	153	172
17	46	9	,,	122	142	162	183
18	46	9	,,	129	150	172	193
19	46	9	,,	136	159	181	204
20	46	9	,,	143	167	191	215
21	44	10	54	155	180	206	232
22	44	10	,,	162	189	216	243
23	44	10	,,	169	197	225	254
24	44	10	,,	176	206	235	265
25	44	10	,,	184	214	245	279
26	43	11	,,	196	228	261	293
27	43	11	,,	203	237	271	305
28	43	11	,,	211	246	281	316
29	40	12	52	226	263	301	339
30	40	12	,,	234	273	312	351

TABLE I.—PART II.

For Double Roving Spinning.

Number of hanks in a pound of rovings.	Inches delivered by the rollers.	Inches gained and stretched.	Length of the stretch.	No. of hanks in a pound of yarn with a draft of 9.	No. of hanks in a pound of yarn with a draft of 10	No. of hanks in a pound of yarn with a draft of 11	No. of hanks in a pound of yarn with a draft of 12.
2	53	3	56	9	10	11	12
3	53	3	”	14	15	17	19
4	52	4	”	19	21	23	25
5	52	4	”	24	26	29	32
6	62	4	”	29	32	35	38
7	51	5	”	34	38	42	46
8	51	5	”	39	44	48	52
9	50	6	”	45	50	55	60
10	50	6	”	50	56	61	67
11	50	6	”	55	61	67	73
12	49	7	”	61	68	75	82
13	49	7	”	66	74	81	89
14	49	7	”	72	80	88	96
15	48	8	”	78	87	95	105
16	48	8	”	84	93	102	112
17	47	9	”	91	101	111	121
18	47	9	”	96	106	118	128
19	46	10	”	104	115	127	138
20	46	10	”	109	121	133	146
21	45	11	”	117	130	143	156
22	44	11	55	123	137	154	165
23	44	11	”	129	143	161	172
24	43	12	”	138	153	168	184
25	43	12	”	144	160	175	192
26	43	12	”	149	166	183	199
27	42	13	”	159	176	194	212
28	42	13	”	165	183	201	220
29	42	13	”	171	189	208	228
30	42	13	”	176	196	216	235
31	41	14	”	187	207	226	249

TABLE II.—PART I. II. & III.

For Soft Weft on Small, Middle, and Large Sized Wheels commencing with 17 *Twists in one inch.*

Small Size.

Number of banks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revoluttons of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,	56	15	,,	7	22	44	17
15	,,	,,	,	,,	16	,,	,,	23	,,	18
20	53	3	,,	,,	17	,,	,,	24	,,	19
25	,,	,,	,,	,,	18	,,	8	26	,,	20
30	,,	,,	,,	,,	19	,,	,,	27	,,	21
35	52	4	,,	,,	20	,,	,,	28	,,	22
40	,,	,,	,,	,,	21	,,	,,	29	45	23
50	,,	3	1	,,	,,	2	,,	31	,,	24
60	51	,,	2	,,	22	4	6	32	,,	25
70	,,	,,	,,	,,	23	,,	,,	33	,,	26
80	50	4	,,	,,	24	,,	,,	34	,,	27
90	,,	,,	,,	,,	25	,,	7	36	,,	28
100	49	,,	3	,,	26	5	,,	38	,,	30
Middle Size.										
10	54	2	,,	56	20	,,	8	28	34	17
15	,,	,,	,,	,,	21	,,	,,	29	35	18
20	53	3	,,	,,	22	,,	9	31	,,	19
25	,,	,,	,,	,,	23	,,	,,	32	,,	20
30	,,	,,	,,	,,	24	,,	10	34	,,	21
35	52	4	,,	,,	26	,,	,,	36	,,	22
40	,,	,,	,,	,,	27	,,	,,	37	,,	23
50	,,	3	1	,,	28	2	9	39	,,	24
60	51	,,	2	,,	29	5	7	41	,,	25
70	,,	,,	,,	,,	30	,,	,,	42	,,	26
80	50	4	,,	,,	31	,,	8	44	,,	27
90	,,	,,	,,	,,	32	,,	9	46	,,	28
100	49	,,	3	,,	33	7	8	48	,,	30
Large Size.										
10	54	2	,,	56	24	,,	10	34	28	17
15	,,	,,	,,	,,	26	,,	,,	36	,,	18
20	53	3	,,	,,	27	,,	11	38	,,	19
25	,,	,,	,,	,,	29	,,	,,	40	,,	20
30	,,	,,	,,	,,	30	,,	12	42	,,	21
35	52	4	,,	,,	32	,,	,,	44	,,	22
40	,,	,,	,,	,,	33	,,	13	46	,,	23
50	,,	3	1	,,	34	3	12	49	,,	24
60	51	,,	2	,,	35	6	10	51	,,	25
70	,,	,,	,,	,,	37	,,	,,	53	,,	26
80	50	4	,,	,,	38	,,	11	55	,,	27
90	,,	,,	,,	,,	39	,,	12	57	,,	28
100	49	,,	3	,,	40	8	,,	60	,,	30

TABLE II.—PART IV. V. & VI.

For Soft Weft on Small, Middle, and Large Sized Wheels, commencing with 18 *Twists in one inch.*

Small Size.

Number of hanks in a pound of yarn	Inches delivered by the rollers.	Inches gained,	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	16	,,	7	23	44	18
15	,,	,,	,,	,,	17	,,	,,	24	,,	19
20	53	3	,,	,,	18	,,	8	26	,,	20
25	,,	,,	,,	,,	19	,,	,,	27	,,	21
30	,,	,,	,,	,,	20	,,	,,	28	,,	22
35	52	4	,,	,,	21	,,	,,	29	45	23
40	,,	,,	,,	,,	22	,,	9	31	,,	24
50	,,	3	1	,,	,,	2	8	32	,,	25
60	51	,,	2	,,	23	4	6	33	,,	26
70	,,	,,	,,	,,	24	,,	,,	34	,,	27
80	50	4	,,	,,	25	,,	7	36	,,	28
90	,,	,,	,,	,,	26	,,	,,	37	,,	29
100	49	,,	3	,,	27	5	,,	39	,,	31

Middle Size.

Number of hanks in a pound of yarn	Inches delivered by the rollers.	Inches gained,	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	21	,,	8	29	35	18
15	,,	,,	,,	,,	22	,,	9	31	,,	19
20	53	3	,,	,,	23	,,	9	32	,,	20
25	,,	,,	,,	,,	24	,,	10	34	,,	21
30	,,	,,	,,	,,	26	,,	,,	36	,,	22
35	52	4	,,	,,	27	,,	,,	37	,,	23
40	,,	,,	,,	,,	28	,,	11	39	,,	24
50	,,	3	1	,,	29	2	10	41	,,	25
60	51	,,	2	,,	30	5	7	42	,,	26
70	,,	,,	,,	,,	31	,,	8	44	,,	27
80	50	4	,,	,,	32	,,	9	46	,,	28
90	,,	,,	,,	,,	33	,,	10	48	,,	30
100	49	,,	3	,,	34	7	9	50	,,	31

Large Size.

Number of hanks in a pound of yarn	Inches delivered by the rollers.	Inches gained,	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	26	,,	10	36	28	18
15	,,	,,	,,	,,	27	,,	11	38	,,	19
20	53	3	,,	,,	29	,,	,,	40	,,	20
25	,,	,,	,,	,,	30	,,	12	42	,,	21
30	,,	,,	,,	,,	32	,,	,,	44	,,	22
35	52	4	,,	,,	33	,,	13	46	,,	23
40	,,	,,	,,	,,	34	,,	15	49	,,	24
50	,,	3	1	,,	35	3	13	51	,,	25
60	51	,,	2	,,	37	6	10	53	,,	26
70	,,	,,	,,	,,	38	,,	11	55	,,	27
80	50	4	,,	,,	39	,,	12	57	,,	28
90	,,	,,	,,	,,	40	,,	13	59	,,	29
100	49	,,	3	,,	41	8	,,	62	,,	31

TABLE II.—PART VII.

For hard Weft on small sized wheels, commencing with 19 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	15	,,	8	23	46	19
15	54	,,	,,	,,	16	,,	,,	24	47	20
20	53	3	,,	,,	17	,,	9	26	46	21
25	53	,,	,,	,,	18	,,	,,	27	,,	22
30	53	,,	,,	,,	19	,,	,,	28	,,	23
35	52	4	,,	,,	20	,,	,,	29	47	24
40	52	,,	,,	,,	21	,,	,,	30	,,	25
50	52	3	1	,,	,,	2	,,	32	,,	26
60	51	,,	2	,,	22	4	7	33	,,	27
70	51	,,	,,	,,	23	,,	8	35	46	28
80	50	4	,,	,,	24	,,	,,	36	,,	29
90	50	,,	,,	,,	25	,,	9	38	,,	31
100	49	,,	3	,,	25	6	8	39	,,	32
110	49	,,	,,	,,	26	,,	9	41	,,	33
120	48	5	,,	,,	27	,,	,,	42	,,	34
130	47	,,	,,	55	28	,,	,,	43	45	35
140	46	,,	4	,,	,,	8	8	44	46	36
150	45	6	,,	,,	29	,,	,,	45	,,	37
160	44	,,	5	,,	,,	9	,,	46	,,	38
170	43	7	,,	,,	30	10	9	49	,,	41
180	43	,,	,,	,,	31	,,	,,	50	,,	42
190	43	,,	,,	,,	32	,,	10	52	,,	43
200	41	,,	6	54	,,	12	9	53	,,	45
210	41	,,	,,	,,	33	,,	,,	54	,,	46
220	41	,,	,,	,,	34	,,	10	56	,,	47
230	41	,,	,,	,,	35	,,	,,	57	,,	48
240	40	7½	6½	,,	,,	13	,,	58	,,	49
250	40	,,	,,	,,	36	,,	,,	59	,,	50
260	40	,,	,,	,,	37	,,	11	61	,,	52
270	40	,,	,,	,,	38	,,	12	63	,,	53
280	38	,,	,,	52	,,	14	,,	64	44	54
290	38	,,	,,	,,	39	,,	13	66	,,	55
300	38	,,	,,	,,	40	,,	,,	67	,,	56
310	38	,,	,,	,,	41	,,	,,	68	,,	57
320	38	,,	,,	,,	42	,,	,,	69	,,	58

TABLE II.—PART VIII.

For hard Weft on middle sized wheels, commencing with 19 *Twists in one inch.*

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	20	,,	11	31	35	19
15	,,	,,	,,	,,	21	,,	,,	32	,,	20
20	53	3	,,	,,	22	,,	12	34	,,	21
25	,,	,,	,,	,,	23	,,	,,	35	,,	22
30	,,	,,	,,	,,	24	,,	13	37	,,	23
35	52	4	,,	,,	25	,,	,,	38	36	24
40	,,	,,	,,	,,	26	,,	,,	39	,,	25
50	,,	3	1	,,	27	2	12	41	,,	26
60	51	,,	2	,,	28	5	9	42	,,	27
70	,,	,,	,,	,,	29	,,	10	44	,,	28
80	50	4	,,	,,	30	,,	11	46	,,	29
90	,,	,,	,,	,,	31	,,	12	48	,,	30
100	48	5	3	,,	32	7	11	50	,,	32
110	,,	,,	,,	,,	33	,,	12	52	,,	33
120	,,	,,	,,	,,	34	,,	,,	53	,,	34
130	47	,,	,,	55	35	,,	13	55	35	35
140	46	,,	4	,,	36	9	12	57	,,	36
150	44	6	5	,,	37	11	11	59	,,	37
160	,,	,,	,,	,,	38	,,	12	61	,,	38
170	43	7	,,	,,	40	12	,,	64	,,	41
180	,,	,,	,,	,,	41	13	,,	66	,,	42
190	42	,,	6	,,	42	14	,,	68	,,	43
200	41	,,	,,	54	43	,,	13	70	,,	45
210	,,	,,	,,	,,	44	,,	,,	71	,,	46
120	,,	,,	,,	,,	45	,,	14	73	,,	47
230	,,	,,	,,	,,	46	,,	,,	74	,,	48
240	40	7½	6½	,,	47	15	,,	76	,,	49
250	,,	,,	,,	,,	48	,,	,,	77	,,	50
260	,,	,,	,,	,,	49	,,	15	79	,,	51
270	,,	,,	,,	,,	50	,,	,,	80	,,	52
280	38	,,	,,	52	51	16	,,	82	34	53
290	,,	,,	,,	,,	52	,,	,,	83	,,	54
300	,,	,,	,,	,,	53	,,	16	85	,,	55
310	,,	,,	,,	,,	54	,,	,,	86	,,	56
320	,,	,,	,,	,,	55	,,	17	88	,,	57

TABLE II.—PART IX.

For hard Weft on large sized wheels, commencing with 19 Twists in one inch.

Number of banks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	„	56	25	„	14	39	28	19
15	54	„	„	„	26	„	15	41	„	20
20	53	3	„	„	28	„	„	43	„	21
25	53	„	„	„	29	„	16	45	„	22
30	53	„	„	„	31	„	„	47	„	23
35	52	4	„	„	32	„	17	49	„	24
40	52	„	„	„	34	„	„	51	„	25
50	52	3	1	„	35	3	15	53	„	26
60	51	„	2	„	36	6	13	55	„	27
70	51	„	„	„	38	„	„	57	„	28
80	50	4	„	„	39	„	14	59	„	29
90	50	„	„	„	40	„	15	61	„	30
100	49	„	3	„	41	9	14	64	„	32
110	49	„	„	„	43	„	„	66	„	33
120	48	5	„	„	44	„	15	68	„	34
130	47	„	„	55	45	„	„	69	„	35
140	46	„	4	„	46	12	13	71	„	36
150	45	6	„	„	48	„	„	73	„	37
160	44	„	5	„	49	14	12	75	„	38
170	43	7	„	„	51	15	13	79	„	41
180	43	„	„	„	52	„	14	81	„	42
190	43	„	„	„	53	„	15	83	„	43
200	41	„	6	54	54	18	14	86	„	44
210	41	„	„	„	55	„	16	89	„	46
220	41	„	„	„	56	„	17	91	„	47
230	41	„	„	„	57	19	„	93	„	48
240	40	7½	6½	„	58	20	„	95	„	49
250	40	„	„	„	59	„	19	98	„	50
260	40	„	„	„	60	21	„	100	„	52
270	40	„	„	„	61	„	20	102	„	53
280	38	„	„	52	62	„	19	102	„	54
290	38	„	„	„	63	„	„	103	„	55
300	38	„	„	„	64	„	„	104	„	56
310	38	„	„	„	65	„	20	106	„	57
320	38	„	„	„	66	„	21	108	„	58

TABLE II.—PART X.

For hard Weft on small sized wheels, commencing with 21 Twists in one inch.

Number of banks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	18	,,	8	26	46	21
15	,,	,,	,,	,,	19	,,	,,	27	,,	22
20	53	3	,,	,,	20	,,	,,	28	,,	23
25	,,	,,	,,	,,	21	,,	,,	29	,,	24
30	,,	,,	,,	,,	22	,,	9	31	,,	25
35	52	4	,,	,,	23	,,	,,	32	,,	26
40	,,	,,	,,	,,	24	,,	,,	33	,,	27
50	51	,,	1	,,	24	2	,,	35	,,	28
60	,,	,,	,,	,,	25	,,	,,	36	,,	29
70	50	,,	2	,,	26	4	7	37	,,	30
80	,,	,,	,,	,,	27	,,	,,	38	,,	31
90	,,	,,	,,	,,	28	,,	,,	39	,,	32
100	49	,,	3	,,	28	6	,,	41	45	33
110	48	5	,,	,,	29	,,	8	43	,,	34
120	,,	,,	,,	,,	30	,,	,,	44	,,	35
130	47	,,	,,	55	31	,,	,,	45	,,	36
140	46	,,	4	,,	31	8	7	46	,,	37
150	45	6	,,	,,	32	,,	8	48	,,	39
160	44	,,	5	,,	32	10	7	49	,,	40
170	43	7	,,	,,	33	,,	,,	50	,,	41
180	,,	,,	,,	,,	34	,,	8	52	,,	42
190	,,	,,	,,	,,	35	,,	,,	53	,,	43
200	41	,,	6	54	35	12	,,	55	,,	45
210	,,	,,	,,	,,	36	,,	,,	56	,,	46
120	,,	,,	,,	,,	36	13	,,	57	,,	47
230	,,	,,	,,	,,	37	,,	,,	58	,,	48
240	40	7½	6½	,,	38	,,	,,	59	,,	49
250	,,	,,	,,	,,	39	,,	,,	60	,,	50
260	,,	,,	,,	,,	40	,,	9	62	,,	51
270	,,	,,	,,	,,	41	,,	10	64	,,	53
280	38	,,	,,	52	42	,,	,,	65	,,	54
290	,,	,,	,,	,,	42	,,	,,	65	44	55
300	,,	,,	,,	,,	43	,,	11	67	,,	56
310	,,	,,	,,	,,	44	,,	,,	68	,,	57
320	,,	,,	,,	,,	45	,,	,,	69	,,	58

TABLE II.—PART XI.

For hard Weft on middle sized wheels, commencing with 21 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	24	,,	11	35	35	21
15	,,	,,	,,	,,	25	,,	,,	36	,,	22
20	53	3	,,	,,	27	,,	10	37	,,	23
25	,,	,,	,,	,,	28	,,	,,	38	36	24
30	,,	,,	,,	,,	29	,,	,,	39	,,	25
35	52	4	,,	,,	30	,,	11	41	,,	26
40	,,	,,	,,	,,	31	,,	,,	42	,,	27
50	51	,,	1	,,	31	2	,,	44	,,	28
60	,,	,,	,,	,,	32	,,	12	46	35	29
70	50	,,	2	,,	33	5	,,	48	,,	30
80	,,	,,	,,	,,	34	,,	11	50	,,	31
90	,,	,,	,,	,,	35	,,	12	52	,,	32
100	49	,,	3	,,	36	7	10	53	,,	33
110	48	5	,,	,,	37	,,	11	55	,,	34
120	,,	,,	,,	,,	38	,,	,,	56	,,	35
130	47	,,	,,	55	39	,,	,,	57	,,	36
140	46	,,	4	,,	40	9	10	59	,,	37
150	45	6	,,	,,	40	10	11	61	,,	38
160	44	,,	5	,,	41	12	,,	63	,,	40
170	43	7	,,	,,	42	,,	,,	65	,,	41
180	,,	,,	,,	,,	43	,,	12	67	,,	42
190	,,	,,	,,	,,	44	,,	13	69	,,	43
200	41	,,	6	54	44	13	,,	70	,,	45
210	,,	,,	,,	,,	45	15	11	71	,,	46
120	,,	,,	,,	,,	46	,,	12	73	,,	47
230	,,	,,	,,	,,	47	,,	13	75	,,	48
240	40	7½	6½	,,	48	,,	,,	76	,,	49
250	,,	,,	,,	,,	49	16	,,	78	,,	50
260	,,	,,	,,	,,	50	,,	14	80	,,	52
270	,,	,,	,,	,,	51	,,	15	82	,,	53
280	38	,,	,,	52	51	,,	17	84	34	54
290	,,	,,	,,	,,	52	17	16	85	,,	55
300	,,	,,	,,	,,	53	,,	,,	86	,,	56
310	,,	,,	,,	,,	54	,,	17	88	,,	57
320	,,	,,	,,	,,	55	,,	,,	89	,,	58

TABLE II.—PART XII.

For hard weft on large sized wheels, commencing with 21 *Twists in one inch.*

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one	Revolutions of the spindle in one inch.
10	54	2	,,	56	30	,,	12	42	28	21
15	54	,,	,,	,,	31	,,	13	44	,,	22
20	53	3	,,	,,	32	,,	14	46	,,	23
25	53	,,	,,	,,	33	,,	15	48	,,	24
30	53	,,	,,	,,	34	,,	16	50	,,	25
35	52	4	,,	,,	35	,,	17	52	,,	26
40	52	,,	,,	,,	36	,,	18	54	,,	27
50	51	,,	1	,,	38	3	15	56	,,	28
60	51	,,	,,	,,	39	,,	16	58	,,	29
70	50	,,	2	,,	40	6	14	60	,,	30
80	50	,,	,,	,,	42	,,	,,	62	,,	31
90	50	,,	,,	,,	43	,,	15	64	,,	32
100	49	,,	3	,,	45	8	13	66	,,	33
110	48	5	,,	,,	46	9	,,	68	,,	34
120	48	,,	,,	,,	47	,,	14	70	,,	35
130	47	,,	,,	55	48	,,	15	72	,,	36
140	46	,,	4	,,	49	11	14	74	,,	37
150	45	6	,,	,,	50	12	,,	76	,,	38
160	44	,,	5	,,	51	14	,,	79	,,	40
170	43	7	,,	,,	52	15	,,	81	,,	41
180	43	,,	,,	,,	53	,,	15	83	,,	42
190	43	,,	,,	,,	54	,,	16	85	,,	43
200	41	,,	6	54	55	17	14	86	,,	44
210	41	,,	,,	,,	56	18	15	89	,,	46
220	41	,,	,,	,,	57	,,	16	91	,,	47
230	41	,,	,,	,,	58	,,	17	93	,,	48
240	40	7½	6½	,,	59	19	,,	95	,,	49
250	40	,,	,,	,,	61	,,	18	98	,,	50
260	40	,,	,,	,,	62	,,	20	101	,,	52
270	40	,,	,,	,,	63	,,	,,	102	,,	53
280	38	,,	,,	52	64	20	19	102	,,	54
290	38	,,	,,	,,	64	,,	,,	103	,,	55
300	38	,,	,,	,,	65	,,	20	105	,,	56
310	38	,,	,,	,,	66	21	,,	107	,,	57
320	38	,,	,,	,,	67	,,	21	109	,,	58

TABLE II.—PART XIII.

For Reeled Twist on small sized wheels, commencing with 22 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	17	,,	10	27	46	22
15	54	,,	,,	,,	18	,,	,,	28	,,	23
20	53	3	,,	,,	19	,,	11	30	45	24
25	53	,,	,,	,,	20	,,	,,	31	46	25
30	52	4	,,	,,	21	,,	,,	32	,,	26
35	52	,,	,,	,,	22	,,	,,	33	,,	27
40	52	,,	,,	,,	23	,,	,,	34	,,	28
50	51	5	,,	,,	24	,,	12	36	,,	29
60	51	,,	,,	,,	25	,,	13	38	45	30
70	50	,,	1	,,	25	2	12	39	,,	31
80	50	,,	,,	,,	26	,,	11	40	,,	32
90	48	6	2	,,	26	4	,,	41	,,	33
100	47	7	,,	,,	27	,,	12	43	,,	34
110	47	,,	,,	,,	28	,,	,,	44	,,	35
120	46	,,	3	,,	28	6	11	45	,,	36
130	44	,,	4	55	29	7	10	46	,,	37
140	44	,,	,,	,,	30	8	,,	48	,,	39
150	42	7½	5½	,,	31	10	8	49	,,	40
160	42	,,	,,	,,	32	,,	,,	50	,,	41
170	42	,,	,,	,,	33	,,	9	52	,,	42
180	42	,,	,,	,,	34	,,	,,	53	,,	43
190	42	,,	,,	,,	35	11	,,	55	,,	45
200	40	,,	6½	54	35	,,	,,	56	,,	46
210	40	,,	,,	,,	36	13	8	57	,,	47
220	40	,,	,,	,,	37	,,	,,	58	,,	48
230	40	,,	,,	,,	38	,,	,,	59	,,	49
240	40	,,	,,	,,	39	,,	,,	60	,,	50
250	40	,,	,,	,,	40	,,	9	62	,,	51
260	40	,,	,,	,,	41	,,	10	64	,,	53
270	40	,,	,,	,,	42	,,	,,	65	,,	54
280	37	8	7	52	40	14	12	66	44	55
290	37	,,	,,	,,	41	,,	13	68	,,	56
300	37	,,	,,	,,	42	,,	,,	69	,,	57
310	37	,,	,,	,,	43	,,	,,	70	,,	58
320	37	,,	,,	,,	44	,,	,,	71	,,	59

TABLE II.—PART XIV.

For Reeled Twist on middle sized wheels, commencing with 22 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	24	,,	12	36	35	22
15	,,	,,	,,	,,	25	,,	,,	37	,,	23
20	53	3	,,	,,	26	,,	,,	38	36	24
25	,,	,,	,,	,,	27	,,	,,	39	,,	25
30	52	4	,,	,,	28	,,	13	41	,,	26
35	,,	,,	,,	,,	29	,,	,,	42	,,	27
40	,,	,,	,,	,,	30	,,	14	44	,,	28
50	51	5	,,	,,	32	,,	,,	46	35	29
60	,,	,,	,,	,,	33	,,	15	48	,,	30
70	50	,,	1	,,	34	2	14	50	,,	31
80	,,	,,	,,	,,	35	,,	15	52	,,	32
90	48	6	2	,,	36	5	12	53	,,	33
100	47	7	,,	,,	37	,,	13	55	,,	34
110	46	,,	3	,,	37	7	12	56	,,	35
120	,,	,,	,,	,,	38	,,	13	58	,,	36
130	44	,,	4	55	39	9	11	59	,,	57
140	,,	,,	,,	,,	40	,,	12	61	,,	38
150	42	7½	5½	,,	40	13	10	63	,,	40
160	,,	,,	,,	,,	41	,,	11	65	,,	41
170	,,	,,	,,	,,	42	,,	12	67	,,	42
180	,,	,,	,,	,,	43	,,	13	69	,,	43
190	,,	,,	,,	,,	44	,,	14	71	,,	45
200	40	,,	6½	54	44	15	,,	73	,,	46
210	,,	,,	,,	,,	45	,,	15	75	34	47
220	,,	,,	,,	,,	46	,,	16	77	,,	48
230	,,	,,	,,	,,	47	,,	17	79	,,	49
240	,,	,,	,,	,,	48	16	,,	81	,,	51
250	,,	,,	,,	,,	49	,,	18	83	,,	52
260	,,	,,	,,	,,	50	17	,,	85	,,	53
270	,,	,,	,,	,,	51	,,	19	87	,,	54
280	37	8	7	52	52	18	18	88	,,	55
290	,,	,,	,,	,,	53	,,	,,	89	,,	56
300	,,	,,	,,	,,	54	,,	19	91	,,	57
310	,,	,,	,,	,,	55	19	,,	93	,,	58
320	,,	,,	,,	,,	56	,,	20	95	,,	59

TABLE II.—PART XV.

For Reeled Twist on large sized wheels, commencing with 22 Twists in one inch.

Number of hanks in a pound of yarn	Inches delivered by the rollers.	Inches gained,	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	29	,,	15	44	28	22
15	,,	,,	,,	,,	30	,,	16	46	,,	23
20	53	3	,,	,,	31	,,	17	48	,,	24
25	,,	,,	,,	,,	32	,,	18	50	,,	25
30	52	4	,,	,,	35	,,	17	52	,,	26
35	,,	,,	,,	,,	36	,,	18	54	,,	27
40	,,	,,	,,	,,	37	,,	19	56	,,	28
50	51	5	,,	,,	39	,,	,,	58	,,	29
60	,,	,,	,,	,,	41	,,	,,	60	,,	30
70	50	,,	1	,,	41	3	18	62	,,	31
80	,,	,,	,,	,,	42	,,	19	64	,,	32
90	48	6	2	,,	44	6	16	66	,,	33
100	47	7	,,	,,	45	,,	17	68	,,	34
110	,,	,,	,,	,,	46	9	15	70	,,	35
120	46	,,	3	,,	48	,,	,,	72	,,	36
130	44	,,	4	55	49	12	12	73	,,	57
140	,,	,,	,,	,,	50	,,	14	76	,,	38
150	42	7½	5½	,,	50	16	13	79	,,	40
160	,,	,,	,,	,,	51	,,	14	81	,,	41
170	,,	,,	,,	,,	53	,,	,,	83	,,	42
180	,,	,,	,,	,,	54	,,	15	85	,,	43
190	,,	,,	,,	,,	56	,,	16	88	,,	44
200	40	,,	6½	54	57	19	14	90	,,	46
210	,,	,,	,,	,,	58	,,	,,	91	,,	47
220	,,	,,	,,	,,	59	,,	15	93	,,	48
230	,,	,,	,,	,,	60	,,	16	95	,,	49
240	,,	,,	,,	,,	61	,,	17	97	,,	50
250	,,	,,	,,	,,	62	,,	19	100	,,	52
260	,,	,,	,,	,,	63	,,	20	102	,,	53
270	,,	,,	,,	,,	64	20	,,	104	,,	54
280	37	8	7	52	64	21	21	106	,,	55
290	,,	,,	,,	,,	65	22	22	109	,,	56
300	,,	,,	,,	,,	66	23	23	112	,,	58
310	,,	,,	,,	,,	67	,,	24	114	,,	59
320	,,	,,	,,	,,	68	,,	25	116	,,	60

TABLE II.—PART XVI.

For Single Roving Twist or Warp on small sized wheels, commencing with 23 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revoluttons of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	19	,,	9	28	46	23
15	,,	,,	,,	,,	20	,,	,,	29	,,	24
20	53	3	,,	,,	21	,,	10	31	,,	25
25	,,	,,	,,	,,	22	,,	,,	32	,,	26
30	52	4	,,	,,	23	,,	,,	33	,,	27
35	,,	,,	,,	,,	24	,,	11	35	,,	28
40	,,	,,	,,	,,	25	,,	,,	36	,,	29
50	51	5	,,	,,	26	,,	,,	37	,,	30
60	,,	,,	,,	,,	27	,,	,,	38	,,	31
70	50	,,	1	,,	27	2	10	39	,,	32
80	,,	,,	,,	,,	28	,,	12	42	45	33
90	48	6	2	,,	28	4	11	43	,,	34
100	47	7	,,	,,	29	,,	,,	44	,,	35
110	,,	,,	,,	,,	30	,,	,,	45	,,	36
120	46	,,	3	,,	31	6	10	47	,,	37
130	44	,,	4	55	31	8	9	48	,,	39
140	,,	,,	,,	,,	32	,,	10	50	,,	40
150	42	7½	5½	,,	32	10	9	51	,,	41
160	,,	,,	,,	,,	33	,,	,,	52	,,	42
170	,,	,,	,,	,,	34	,,	,,	53	,,	43
180	,,	,,	,,	,,	35	11	,,	55	,,	45
190	,,	,,	,,	,,	36	,,	,,	56	,,	46
200	40	,,	6½	54	36	12	,,	57	,,	47
210	,,	,,	,,	,,	37	,,	,,	58	,,	48
220	,,	,,	,,	,,	38	,,	,,	59	,,	49
230	,,	,,	,,	,,	39	,,	,,	60	,,	50
240	,,	,,	,,	,,	40	13	,,	62	,,	51
250	,,	,,	,,	,,	41	,,	10	64	,,	53
260	,,	,,	,,	,,	42	,,	,,	65	,,	54
270	,,	,,	,,	,,	43	14	9	66	,,	55
280	37	8	7	52	43	,,	10	67	44	56
290	,,	,,	,,	,,	44	,,	,,	68	,,	57
300	,,	,,	,,	,,	45	,,	,,	69	,,	58
310	,,	,,	,,	,,	46	,,	,,	70	,,	59
320	,,	,,	,,	,,	47	,,	,,	71		60

TABLE II.—PART XVII.

For Single Roving Twist or Warp on middle sized wheels, commencing with 23 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revoluttons of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	,,	56	25	,,	12	37	35	23
15	,,	,,	,,	,,	26	,,	,,	38	36	24
20	53	3	,,	,,	27	,,	,,	39	,,	25
2	,,	,,	,,	,,	28	,,	13	41	,,	26
30	52	4	,,	,,	29	,,	,,	42	,,	27
35	,,	,,	,,	,,	30	,,	14	44	,,	28
40	,,	,,	,,	,,	31	,,	15	46	,,	29
50	51	5	,,	,,	33	,,	,,	48	35	30
60	,,	,,	,,	,,	34	,,	16	50	,,	31
70	50	,,	1	,,	34	3	15	52	,,	32
80	,,	,,	,,	,,	35	,,	,,	53	,,	33
90	48	6	2	,,	35	5	,,	55	,,	34
100	47	7	,,	,,	36	,,	,,	56	,,	35
110	46	,,	3	,,	37	7	14	58	,,	36
120	,,	,,	,,	,,	38	,,	,,	59	,,	37
130	44	,,	4	55	39	9	,,	62	,,	39
140	,,	,,	,,	,,	40	10	13	63	,,	40
150	42	7½	5½	,,	40	12	,,	65	,,	41
160	,,	,,	,,	,,	41	,,	14	67	,,	42
170	,,	,,	,,	,,	42	13	,,	69	,,	43
180	,,	,,	,,	,,	43	,,	15	71	,,	45
190	,,	,,	,,	,,	44	,,	16	73	,,	46
200	40	,,	6½	54	44	15	15	74	,,	47
210	,,	,,	,,	,,	45	,,	,,	75	,,	48
220	,,	,,	,,	,,	46	,,	16	77	,,	49
230	,,	,,	,,	,,	47	,,	17	79	,,	50
240	,,	,,	,,	,,	48	16	,,	81	,,	52
250	,,	,,	,,	,,	49	,,	,,	82	,,	53
260	,,	,,	,,	,,	50	,,	18	84	,,	54
270	,,	,,	,,	,,	51	,,	,,	85	,,	55
280	37	8	7	52	51	17	,,	86	34	56
290	,,	,,	,,	,,	52	18	,,	88	,,	57
300	,,	,,	,,	,,	53	,,	,,	89	,,	58
310	,,	,,	,,	,,	54	,,	19	91	,,	59
320	,	,,	,,	,,	55	,,	,,	92	,,	60

TABLE II.—PART XVIII.

For Single Roving Twist or Warp on large sized wheels, commencing with 23 Twists in one inch.

Number of banks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	54	2	"	56	31	"	15	46	28	23
15	"	"	"	"	32	"	16	48	"	24
20	53	3	"	"	33	"	17	50	"	25
25	"	"	"	"	34	"	18	52	"	26
30	52	4	"	"	35	"	19	54	"	27
35	"	"	"	"	36	"	20	56	"	28
40	"	"	"	"	38	"	"	58	"	29
50	51	5	"	"	40	"	"	60	"	30
60	"	"	"	"	42	"	"	62	"	31
70	50	"	1	"	43	3	18	64	"	32
80	"	"	"	"	45	"	"	66	"	33
90	48	6	2	"	46	6	16	68	"	34
100	47	7	"	"	47	7	"	70	"	35
110	"	"	"	"	49	"	"	72	"	36
120	46	"	3	"	50	10	15	75	"	37
130	44	"	4	55	51	11	"	77	"	39
140	"	"	"	"	53	"	"	79	"	40
150	42	7½	5½	"	54	14	13	81	"	41
160	"	"	"	"	56	"	"	83	"	42
170	"	"	"	"	57	15	14	86	"	43
180	"	"	"	"	58	"	15	88	"	44
190	"	"	"	"	59	"	16	90	"	45
200	40	"	6½	54	59	17	"	92	"	47
210	"	"	"	"	60	"	"	93	"	48
120	"	"	"	"	61	"	17	95	"	49
230	"	"	"	"	62	"	18	97	"	50
240	"	"	"	"	63	"	19	99	"	51
250	"	"	"	"	64	"	21	102	"	52
260	"	"	"	"	65	"	22	104	"	54
270	"	"	"	"	66	18	"	106	"	55
280	37	8	7	52	66	19	20	105	"	56
290	"	"	"	"	67	20	19	106	"	57
300	"	"	"	"	68	"	20	108	"	58
310	"	"	"	"	69	"	21	110	"	59
320	"	"	"	"	70	"	22	112	"	60

TABLE II.—PART XIX.

For Double Roving Twist or Warp on small sized wheels, commencing with 23 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained,	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	53	3	,,	56	19	,,	9	28	46	23
15	,,	,,	,,	,,	20	,,	,,	29	,,	24
20	52	4	,,	,,	21	,,	10	31	,,	25
25	,,	,,	,,	,,	22	,,	,,	32	,,	26
30	51	5	,,	,,	23	,,	,,	33	,,	27
35	,,	,,	,,	,,	24	,,	11	35	,,	28
40	50	6	,,	,,	25	,,	,,	36	,,	29
50	,,	,,	,,	,,	26	,,	,,	37	,,	30
60	49	7	,,	,,	27	,,	,,	38	,,	31
70	,,	,,	,,	,,	28	,,	,,	39	,,	32
80	,,	,,	,,	,,	29	,,	,,	40	,,	33
90	48	8	,,	,,	30	,,	12	42	,,	34
100	46	,,	2	,,	29	4	10	43	,,	35
110	,,	,,	,,	,,	30	,,	11	45	45	36
120	45	,,	2½	,,	31	5	,,	47	,,	37
130	44	8½	,,	55	32	,,	,,	48	,,	39
140	43	9	3	,,	33	6	10	49	,,	40
150	,,	,,	,,	,,	34	,,	,,	50	,,	41
160	42½	,,	3½	,,	35	7	,,	52	,,	42
170	,,	,,	,,	,,	36	,,	,,	53	,,	43
180	42	,,	4	,,	37	8	,,	55	,,	45
190	,,	,,	,,	,,	38	,,	11	57	,,	46
200	40	,,	5	54	38	10	9	57	,,	47
210	,,	,,	,,	,,	39	,,	,,	58	,,	48
220	,,	,,	,,	,,	40	11	8	59	,,	49
230	39	,,	6	,,	40	12	,,	60	,,	50
240	,,	,,	,,	,,	41	,,	9	62	,,	51
250	,,	,,	,,	,,	42	,,	10	64	,,	53
260	,,	,,	,,	,,	43	13	9	65	,,	54

TABLE II.—PART XX.

For Double Roving Twist or Warp on middle sized wheels, commencing with 23 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revoluttons of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	53	3	,,	56	25	,,	12	37	35	23
15	,,	,,	,,	,,	26	,,	,,	38	36	24
20	52	4	,,	,,	27	,,	,,	39	,,	25
25	,,	,,	,,	,,	28	,,	13	41	,,	26
30	51	5	,,	,,	29	,,	,,	42	,,	27
35	,,	,,	,,	,,	30	,,	14	44	,,	28
40	50	6	,,	,,	31	,,	15	46	,,	29
50	,,	,,	,,	,,	33	,,	,,	48	35	30
60	49	7	,,	,,	34	,,	16	50	,,	31
70	,,	,,	,,	,,	35	,,	17	52	,,	32
80	,,	,,	,,	,,	37	,,	16	53	,,	33
90	48	8	,,	,,	38	,,	17	55	,,	34
100	46	,,	2	,,	37	5	14	56	,,	35
110	,,	,,	,,	,,	38	,,	15	58	,,	36
120	45	8½	2½	,,	39	6	14	59	,,	37
130	44	,,	,,	55	40	,,	15	61	,,	39
140	43	9	3	,,	41	8	14	63	,,	40
150	,,	,,	,,	,,	42	,,	15	65	,,	41
160	42½	,,	3½	,,	43	9	,,	67	,,	42
170	,,	,,	,,	,,	44	,,	16	69	,,	43
180	42	,,	4	,,	45	11	15	71	,,	45
190	,,	,,	,,	,,	46	,,	16	73	,,	46
200	40	,,	5	54	47	12	15	74	,,	47
210	,,	,,	,,	,,	48	,,	,,	75	,,	48
220	,,	,,	,,	,,	49	,,	16	77	,,	49
230	39	,,	6	,,	50	14	15	79	,,	50
240	,,	,,	,,	,,	51	,,	16	81	,,	52
250	,,	,,	,,	,,	52	,,	,,	82	,,	53
260	,,	,,	,,	,,	53	,,	17	84	,,	54

TABLE II.—PART XXI.

For Double Roving Twist or Warp on large sized wheels, commencing with 23 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revoluttons of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	53	3	,,	56	31	,,	15	46	28	23
15	,,	,,	,,	,,	32	,,	16	48	,,	24
20	52	4	,,	,,	33	,,	17	50	,,	25
25	,,	,,	,,	,,	34	,,	18	52	,,	26
30	51	5	,,	,,	35	,,	19	54	,,	27
35	,,	,,	,,	,,	36	,,	20	56	,,	28
40	50	6	,,	,,	38	,,	,,	58	,,	29
50	,,	,,	,,	,,	40	,,	,,	60	,,	30
60	49	7	,,	,,	42	,,	,,	62	,,	31
70	,,	,,	,,	,,	44	,,	,,	64	,,	32
80	,,	,,	,,	,,	46	,,	,,	66	,,	33
90	48	8	,,	,,	48	,,	,,	68	,,	34
100	46	,,	2	,,	47	6	17	70	,,	35
110	,,	,,	,,	,,	48	,,	18	72	,,	36
120	45	8½	2½	,,	49	7	19	75	,,	37
130	44	,,	,,	55	50	,,	20	77	,,	39
140	43	9	3	,,	51	9	19	79	,,	40
150	,,	,,	,,	,,	52	,,	20	81	,,	41
160	42½	,,	3½	,,	53	10	,,	83	,,	42
170	,,	,,	,,	,,	54	,,	22	86	,,	43
180	42	,,	4	,,	56	12	20	88	,,	44
190	,,	,,	,,	,,	57	,,	21	90	,,	46
200	40	,,	5	54	58	15	19	92	,,	47
210	,,	,,	,,	,,	59	,,	,,	93	,,	48
220	,,	,,	,,	,,	61	,,	,,	95	,,	49
230	39	,,	6	,,	62	18	17	97	,,	50
240	,,	,,	,,	,,	63	,,	18	99	,,	51
250	,,	,,	,,	,,	65	,,	19	102	,,	53
260	,,	,,	,,	,,	66	,,	20	104	,,	54

TABLE II.—PART XXII.

For Cop Twist or Warp on large sized wheels, commencing with 23 Twists in one inch.

Number of hanks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	52	2	,,	54	21	,,	6	27	46	23
15	,,	,,	,,	,,	22	,,	,,	28	,,	23¾
20	51	3	,,	,,	23	,,	,,	29	,,	24½
25	,,	,,	,,	,,	24	,,	,,	30	,,	25½
30	,,	,,	,,	,,	25	,,	,,	31	,,	26¼
35	50	4	,,	,,	26	,,	,,	32	,,	27¼
40	,,	,,	,,	,,	27	,,	,,	33	,,	28
45	,,	,,	,,	,,	28	,,	,,	34	,,	28¾
50	49	5	,,	,,	29	,,	,,	35	45	29¼
55	,,	,,	,,	,,	30	,,	,,	36	,,	30
60	,,	,,	,,	,,	31	,,	,,	37	,,	30¾
65	48	6	,,	,,	32	,,	,,	38	,,	31½
70	,,	,,	,,	,,	33	,,	,,	39	,,	32½
75	,,	,,	,,	,,	34	,,	,,	40	,,	33¼
80	,,	,,	,,	,,	35	,,	,,	41	,,	34
90	47	7	,,	,,	37	,,	,,	43	44	35
100	46	,,	1	,,	37	2	5	44	,,	35¾
110	45	7½	,,	,,	37	,,	6	45	,,	36
120	44	,,	2	,,	37	4	,,	47	,,	37
130	,,	,,	,,	,,	38	5	,,	49	,,	38
140	43	,,	3	,,	39	6	5	50	,,	40
150	,,	,,	,,	,,	40	7	,,	52	,,	41
160	42	,,	4	,,	40	9	,,	54	,,	43
170	,,	,,	,,	,,	41	,,	6	56	,,	44
180	41	,,	5	,,	40	11	,,	57	,,	45
190	,,	,,	,,	,,	41	,,	,,	58	,,	46
200	40	,,	6	,,	41	13	,,	60	,,	47
210	,,	,,	,,	,,	42	,,	7	62	,,	49
220	39	8	7	,,	43	14	,,	64	,,	50
230	,,	,,	,,	,,	44	,,	,,	65	,,	51
240	,,	,,	,,	,,	45	,,	8	67	42	52
250	,,	,,	,,	,,	46	15	,,	69	,,	53
260	,,	,,	,,	,,	47	,,	9	71	,,	55
270	,,	,,	,,	,,	48	16	,,	73	,,	56
280	,,	,,	,,	,,	49	,,	10	74	,,	57
290	,,	,,	,,	,,	50	,,	,,	75	,,	58
300	,,	,,	,,	,,	51	,,	11	77	,,	59
310	,,	,,	,,	,,	52	,,	,,	78	,,	60
320	,,	,,	,,	,,	54	,,	,,	80	,,	62

TABLE II.—PART XXIII.

For Cop Twist or Warp on middle sized wheels, commencing with 23 Twists in one inch.

Number of banks in a pound of yarn.	Inches delivered by the rollers.	Inches gained.	Inches stretched.	Length of the stretch.	Revolutions of the rim or handle in the roller part.	Revolutions in the stretching part.	Revolutions at the head.	Revolutions in all.	Revolutions of the spindle for rim or handle one.	Revolutions of the spindle in one inch.
10	50	2	,,	52	25	,,	10	35	34	22¾
15	50	,,	,,	,,	26	,,	,,	36	,,	23½
20	49	3	,,	,,	27	,,	,,	37	,,	24¼
25	49	,,	,,	,,	28	,,	,,	38	,,	25
30	49	,,	,,	,,	29	,,	,,	39	,,	25½
35	48	4	,,	,,	31	,,	,,	41	,,	26¾
40	48	,,	,,	,,	32	,,	,,	42	,,	27¼
45	48	,,	,,	,,	33	,,	,,	43	,,	28
50	47	5	,,	,,	34	,,	,,	44	,,	28¼
55	47	,,	,,	,,	35	,,	,,	45	,,	29¼
60	47	,,	,,	,,	36	,,	,,	46	,,	30
65	46	6	,,	,,	38	,,	,,	48	,,	31¼
70	46	,,	,,	,,	39	,,	,,	49	,,	32
75	46	,,	,,	,,	40	,,	,,	50	,,	32½
80	46	,,	,,	,,	41	,,	,,	51	,,	33¼
90	45	7	,,	,,	43	,,	,,	53	,,	34½
100	44	,,	1	,,	43	2	9	54	,,	35¼
110	43	7½	1½	,,	44	3	,,	56	,,	36
120	42	,,	2½	,,	46	5	7	58	,,	37
130	42	,,	,,	,,	47	6	,,	60	,,	39
140	41	,,	3½	,,	48	7	,,	62	,,	40
150	40	,,	4½	,,	49	9	,,	64	,,	41
160	40	,,	,,	,,	50	10	,,	66	,,	43
170	39	,,	5½	,,	50	11	6	67	,,	44
180	39	,,	,,	,,	51	,,	7	69	,,	45
190	38	,,	6½	,,	51	13	,,	71	,,	46
200	38	,,	,,	,,	52	14	,,	73	,,	47
210	37	8	7	,,	53	15	,,	75	,,	49
220	37	,,	,,	,,	54	15	8	77	,,	50
230	37	,,	,,	,,	55	16	,,	79	,,	51
240	37	,,	,,	,,	56	,,	9	81	,,	52
250	37	,,	,,	,,	57	,,	10	83	,,	54
260	37	,,	,,	,,	58	,,	11	85	,,	55
270	37	,,	,,	,,	59	17	,,	87	,,	56
280	37	,,	,,	,,	60	,,	,,	88	,,	57
290	37	,,	,,	,,	61	,,	,,	89	,,	58
300	37	,,	,,	,,	62	,,	12	91	,,	59
310	37	,,	,,	,,	64	,,	,,	93	,,	60
320	37	,,	,,	,,	66	,,	,,	95	,,	62

A TABLE

OF THE

Drafts and distances that the Rollers should be placed from each other.

For the draft between the back and front Roller, see pages 42 and 43; but for the draft between back and middle roller, and the distances between the front, middle, and back roller, see the following Table.	Draft between Back and Middle Roller	Back Roller.	Distance between Front and Middle Roller.	Distance between Back and Middle Roller.
It may be necessary if the cotton be shorter than $0\frac{7}{8}$*in.* or the distance more than $1\frac{3}{16}$*in.* between back and middle roller to have a draft of	11	10	0	0
This is for Cotton that is $0\frac{7}{8}$*in.* in staple .	10	9	$0\frac{7}{8}$	$1\frac{3}{16}$
This is for Cotton that is 1*in.* in staple . .	9	8	1	$1\frac{1}{4}$
This is for Cotton that is $1\frac{1}{8}$*in.* in staple .	8	7	$1\frac{1}{8}$	$1\frac{3}{8}$
This is for Cotton that is $1\frac{3}{16}$*in.* in staple .	7	6	$1\frac{3}{16}$	$1\frac{1}{2}$
This is for Cotton that is $1\frac{1}{4}$*in.* in staple .	6	5	$1\frac{1}{4}$	$1\frac{1}{2}$
For double roving spinning for Cotton that is 1*in.* in staple	8	7	$1\frac{1}{32}$	$1\frac{3}{8}$
For double roving spinning for Cotton that is $1\frac{1}{8}$*in.*	7	6	$1\frac{5}{32}$	$1\frac{1}{2}$
For double roving spinning for Cotton that is $1\frac{3}{16}$*in*	6	5	$1\frac{1}{4}$	$1\frac{1}{2}$
For double roving spinning for Cotton that is $1\frac{1}{4}$*in.*	6	$4\frac{3}{4}$	$1\frac{9}{32}$	$1\frac{5}{8}$

Note.—If it is intended to spin with either more or less Twists than is mentioned in the Table, add or diminish the revolutions in the roving and stretching parts; or to spin with shorter or longer stretches, deminish or add the revolutions in proportion to the length of the stretch. For soft or weak cotton, add two or more revolutions of the rim or handle as it may be found necessary in the roving part.